

Dental Digest

April 1958

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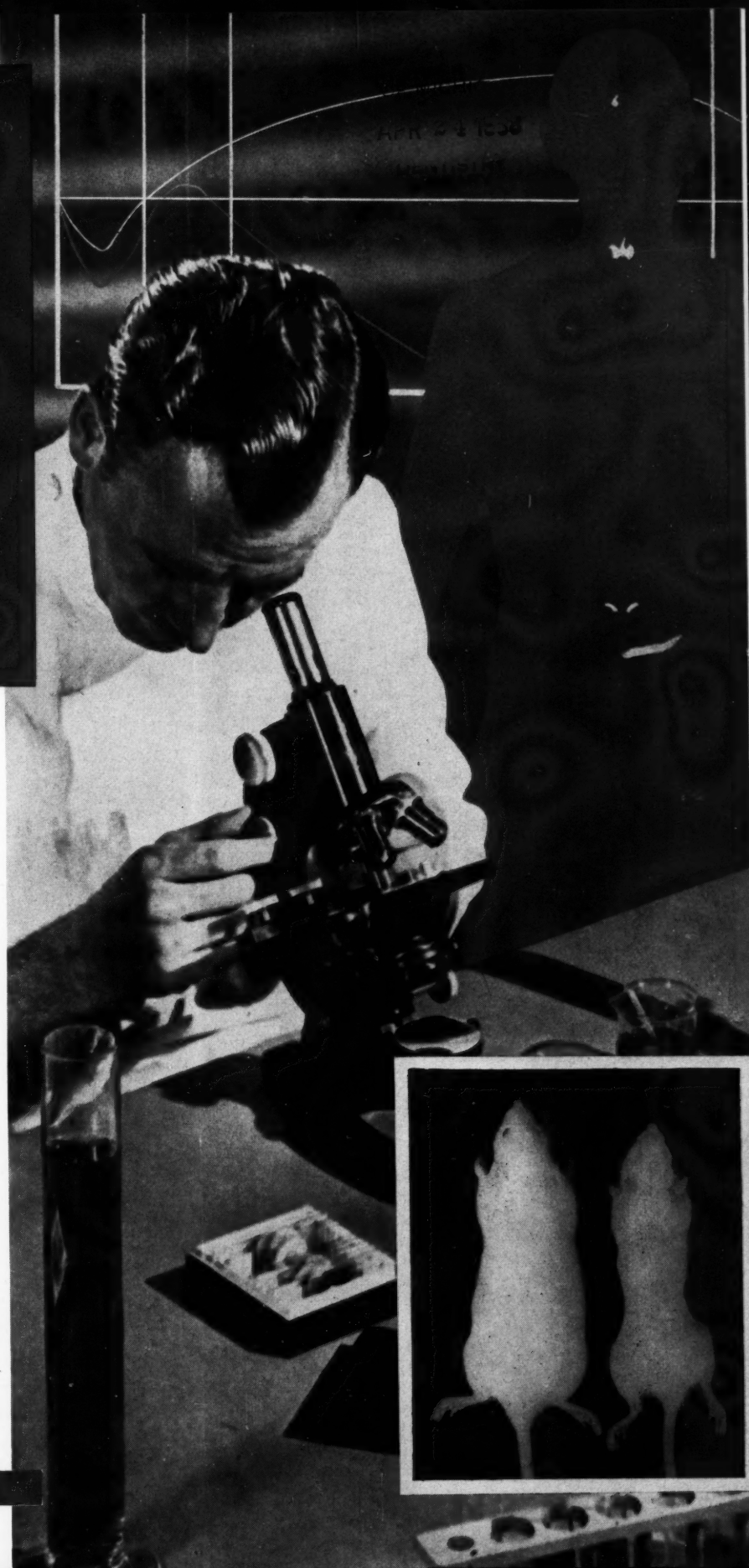
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IMMEDIATE DENTURES

with Conservative Surgery

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DIGEST

Many dentists advocate conservative surgical measures in immediate denture techniques. The term conservative, however, has numerous interpretations. This definitive article presents a step-by-step outline of a conservative technique that the author has applied successfully in his practice.

Conservative Surgical Procedure Advised

(1) Jordan¹ states that sometimes too much tissue is removed and the sulcus depth shortened by tight suturing.

(2) Miller² makes a similar observation. It is wise to perform too little surgery than too much; the goal should be to achieve successful results within the minimum limits of surgery.

(3) Both Frahm³ and Pearce⁴ are among the dentists who believe the labial plate of bone should not be removed.

(4) Gieler⁵ suggests a minimum amount of surgery even if it means repeating surgical procedures later. Many operators have advocated conservation of the soft tissue. Among these are Harris⁶, Schlosser⁷, Schweitzer⁸, Landa⁹, and Swenson¹⁰.

*Various Interpretations of Term—*Most dentists agree that there should be conservation of the process, although they may favor raising a flap and chiseling away the labial plate. Agreement has not been reached on the meaning of the term, conservative. In the author's opinion conservative treatment includes surgery that will permit the patient to wear the dentures with comfort, look natural, and

permit the smallest amount of shrinkage later.

*General Description of Conservative Method—*In this technique the tissue is conservatively shaped without cutting away the labial plate of bone, and without raising a flap and the denture is then fitted to the soft tissue. Immediate dentures should not be constructed at the expense of the patient's soft tissue. The soft tissue must be shaped with a minimum of destruction of the labial cortex, with a minimum change in the sulcus depth and when the soft tissue has

been ideally shaped, the denture should be relieved to fit the tissue. The use of a celluloid matrix as a surgical guide could dictate the removal of more of the cortical bone than is advisable.

Preparatory Steps

The patient should be informed of the advantages and disadvantages of immediate dentures. The limitations of immediate dentures should be well understood, with the full knowledge that new dentures must be made later or the immediate dentures rebased. The advantages, which have been described many times, far outweigh the disadvantages. The following steps may then be taken:

1. All posterior teeth should be extracted and the tissue shaped for wearing dentures. Only the six anterior teeth are left as shown in Figure 1. In this illustration can be seen the protrusion of the process and the prominence of the cuspid eminence, which would require some reduction. This is the average case.

2. Undercuts in the tuberosity area should be reduced when the teeth are extracted or immediately if extraction has not already been done.

3. The low hanging or pendulous type of tuberosities are reduced by removing a wedge-shaped piece from

¹Jordan, Luzerne G.: Cooperation of Oral Surgeon and Prosthodontist in Rendering Artificial Denture Service, *J. Oral Surg.* 9:292-294 (October) 1951.

²Miller, Howard C.: Mouth Preparation for Dentures, *Illinois D. J.* 9:244-246 (July) 1940.

³Frahm, F. W.: Cast Preparation for Immediate Restorations, *JADA and D. Cosmos* 24:551-560 (April) 1937.

⁴Pearce, James H.: The Immediate Denture is Accepted, *Fortnightly Review* 7-11 (November) 1944.

⁵Gieler, Carl W.: Immediate Denture Prosthesis, *J. Wisconsin D. Soc.* 30:151-158 (September) 1954.

⁶Harris, Harold Lytton: An Immediate Full Denture Technic, *JADA* 22:1656-1676 (October) 1935.

⁷Schlosser, Rudolph O.: Rational Clinical Procedure in Complete Immediate Denture Prosthesis, *J. S. Calif. D. A.* 13:13-17 (November) 1946.

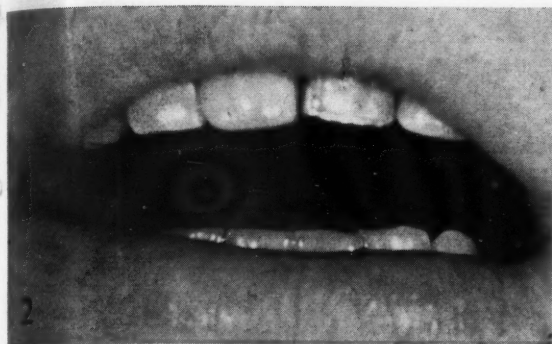
⁸Schweitzer, Jerome M.: Immediate Dentures—Theory and Procedures, *Dental Items Int.* 64:366-479 (May) 1942.

⁹Landa, Joseph Simeon: Mouth Preparation for Full Dentures, *D. Items Int.* 65:977-979 (October) 1943.

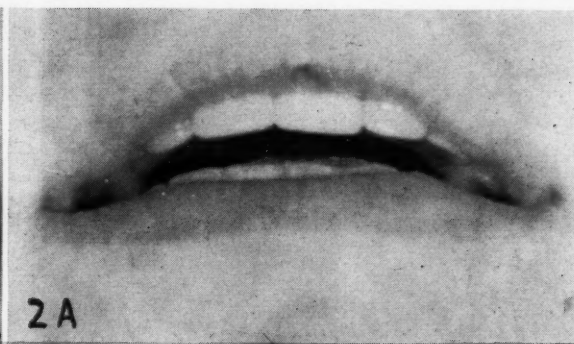
¹⁰Swenson, Merrill G.: Improving Immediate Dentures in General Practice, *JADA* 47:550-556 (November) 1953.



1. Lateral view of patient for immediate dentures. Shows usual protrusion of tissue and cuspid eminence, and the necessity for surgery.



2. Appearance of patient's lip line before extractions.



2A. Appearance of patient after immediate dentures were inserted.

the crest and suturing. Sometimes this can be done better by cutting out the wedge shape and slicing a quarter inch into the lingual and labial segments halfway between the surface and periosteum, parallel to the bone. This measure gives flexibility to the

tissue and permits this fibrous tissue to be approximated.

4. Any tubercle or exostosis should be surgically removed.

All of these steps should be completed six or eight weeks before the impressions are taken.

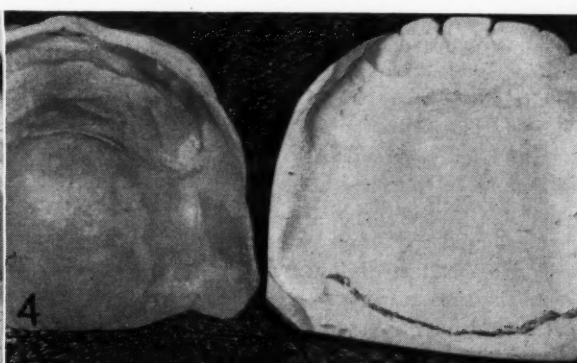
Procedure

Taking the Impressions—In order to make acceptable impressions for immediate dentures it is necessary to make accurately fitting trays of shellac baseplate or acrylic.

1. Make alginate impressions in

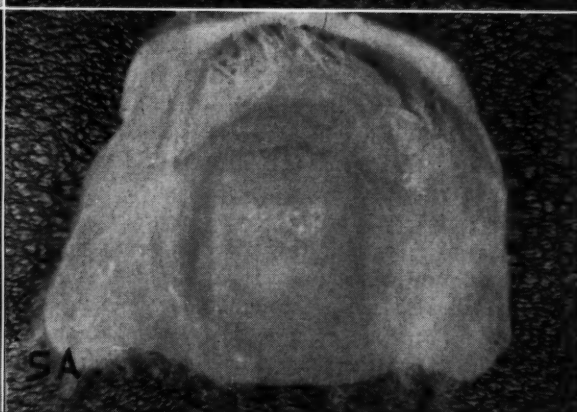


3. Snap impression in stock metal tray. Shows inadequacy of this type of impression, with improper periphery.



4. Snap model is poured and oversize double thickness baseplate tray is constructed. The tray is tried and cut down just short of the mucobuccal fold. Relieve for labial frenum and other low muscle attachments.

5. Fitted tray is painted heavily with a sticky varnish



(ground acrylic dissolved in chloroform). Cotton fibers can now be added.

5A. Cotton fibers are added to the sticky tray to act as a binder for the alginate impression material. It is almost impossible to get the cotton down in the deep part of the tray, so holes are drilled there first to lock in the alginate impression material.



6. Before the final impression mark the posterior border with indelible pencil. This mark will be transferred to the final impression.



7. The final alginate impression. The posterior extremity marked by transfer from the mouth.

stock metal trays. These metal trays rarely fit well enough to take final impressions. The inadequacy of these trays and impressions is shown in Figure 3.

2. Snap models are poured and oversize double thickness shellac baseplate trays are made (Fig. 4).

3. The baseplate tray is adapted over lead foil covering the teeth on the snap model to make it oversize.

4. The tray is adjusted in the mouth and relieved for muscle attachments, so that there is no impingement. The rims are just short of the mucobuccal fold. Swenson¹⁰ suggests that this is one of the best methods of taking impressions for immediate dentures.

Preparing the Trays — (1) Holes are drilled in the recessed part of the tray with a No. 8 bur, enough to ensure locking the alginate. (2) The edentulous part of the tray as well as the entire periphery is painted heavily with a sticky varnish (Fig. 5). This varnish can be made of acrylic grindings dissolved in chloroform. (3) Cotton fibers are applied and stuck to the tray so the alginate impression material will be bound to the tray (Fig. 5A).

Marking the Postdam—Swenson¹¹ suggests marking the location of the posterior line of the postdam area with indelible pencil in the mouth and



8. Central, lateral and cuspid are removed one at a time and replaced with porcelain teeth. About 2 millimeters are trimmed off the lower edge of the labial of the cast to make room for the new teeth.

transferring this to the alginate impression. This is done, using the accepted landmarks for the postdam area (Fig. 6). The landmarks will show in the final alginate impression (Fig. 7). In order to take a good muscle-trimmed impression complete the following steps:

1. Fill the tray with properly mixed alginate impression material and with the first and second fingers place some of the material in the vault of the palate and in both tuberosity vestibules. Be sure to raise the lip as the impression tray and material is placed in the mouth and then massage the lip down. This is to muscle trim and to force out any trapped air.

2. Master models are poured in the master impression and the indelible marking on the model for the postdam is grooved with a No. 8 round bur to about one-half the diameter of the bur.

3. Baseplate bite rims are made and a bite taken. It is easier to check centric with the natural teeth in position.

Setting Up the Teeth—Follow accepted techniques of mounting the bite on the articulator and setting up the new teeth:

1. A good procedure is to remove one central; replace it.
2. Remove the adjacent lateral and replace it.

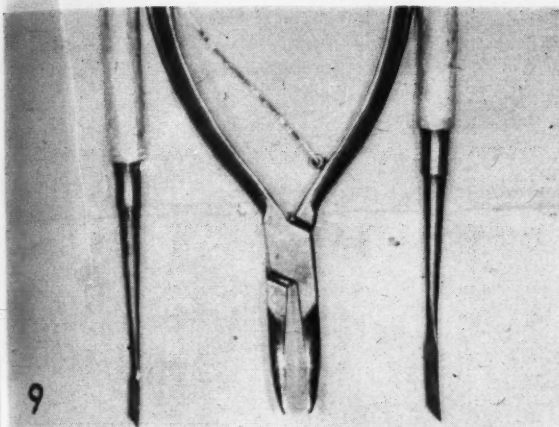
3. Also remove the cuspid (Fig. 8).

4. Sometimes it is necessary to change the position of the teeth, for example, in opening the bite, or shifting the center line, or for esthetic reasons.

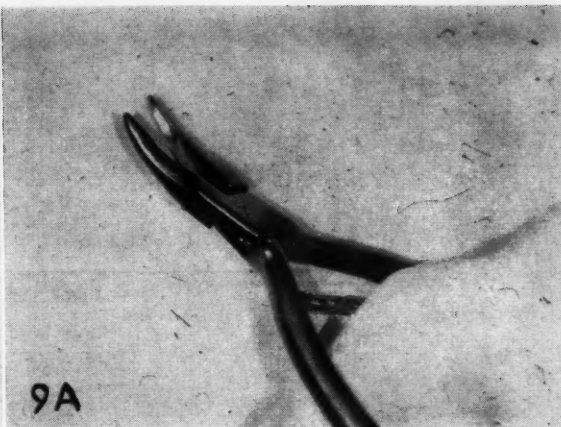
Trimming the Cast—As each tooth is cut off the cast and a new one placed, it is necessary to cut out about two millimeters of space lingually and gingivally, unless it is desired to set the new teeth back more. In this case more stone can be cut away. That is, remove from the outer crest of the ridge enough stone to make room for the new teeth.

Irregularities Trimmed Away—When the flask is opened for trial packing, the irregularities on the case are trimmed away. If it is impossible

¹¹Swenson, Merrill G.: *Complete Dentures*, ed. 2, St. Louis, C. V. Mosby Co., 1947, p. 479.



9. Usually one chisel, a small tapering beak, double cutting edge, and rongeur are all the instruments needed for the bone surgery.



9A. Shows the cutting edge of the tapering rongeur for removing the interdental septum.

for the operator to be present at the opening of the flask, the following method may be used:

1. With the three teeth on one side set up, close into soft wax and chill. Remove these teeth and trim the cast on this side.
2. Replace the teeth in their wax bite, and close, and lute back to the cast.
3. Cut the teeth from the other side of the cast in the same manner and follow the same procedure for trimming the cast.
4. Trim away undesirable undercut in the anterior region that would hinder easy insertion of the denture.
5. Give the tissue an ideal shape (Figs. 16 and 20). Soft tissue that slants back or that is too converging is not desired. It should be broad and round.

Construction of Lower Immediate Denture

The suggestions made can apply to both upper and lower dentures, but a lower immediate full denture should not be necessary. Too often it will not have stability enough to permit the patient to use it. The patient will be able to use the upper as soon as feeling comes back in the lips and he can eat soft foods. This cannot be said for the average lower immediate denture.

Patience Required for Adjustment—The patient frequently lays the den-

ture aside with the intention of waiting a few days until the soreness is relieved. Under favorable conditions this can be done but it will be a constant care until tissue is completely healed. Relining materials will have to be used frequently.

A Successful Technique—A procedure that produces a percentage of successes equal to that with upper dentures is to postpone two of the extractions, one on each side, and let the patient wear a simple partial for six months, or a year, or longer. Simple clasps are used on these two teeth. Even if only one serviceable tooth is left, it will be helpful. The lower anterior teeth are extracted and the immediate partial denture is inserted. Undercuts in this area are reduced as for uppers.

Advantages—The partial denture will stay in place and not slip and slide. The patient can use it immediately. He will become adjusted to the feel of this partial denture in the mouth and will learn to use it. It becomes an integral part of the oral situation and when the anchor teeth are finally extracted and a quick cure repair done, he can still wear it. He has been wearing it for a year. Self-curing relining material is used in the denture to ensure a good fit.

Difficult Adjustment Avoided—Completing the lower this way there is not the surprise and disappoint-

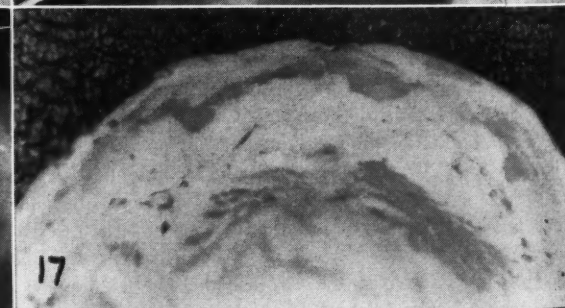
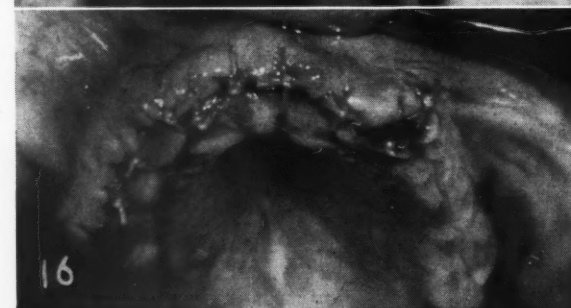
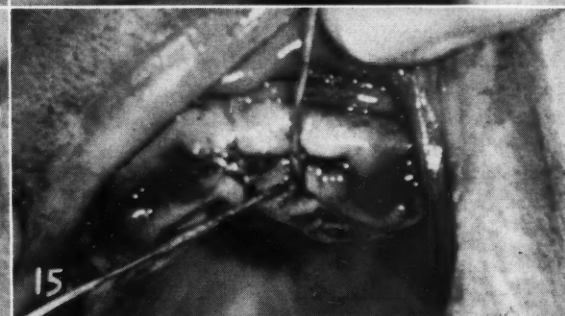
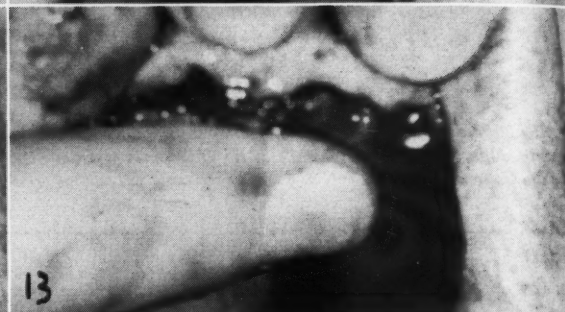
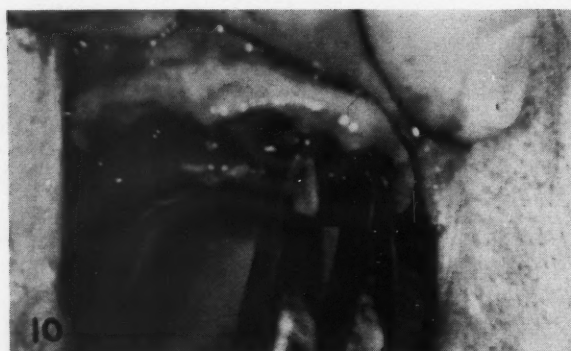
ment that is involved in adjusting to a new full immediate lower denture. In this procedure there are only two small areas of unhealed tissue which occur when the last two teeth are extracted. The teeth left can be a combination of any two teeth including the cuspids, one on each side.

Completion of Technique—The upper denture is finished leaving the labial flange just a little thick until after it is fitted to the tissue. Then the entire labial flange is ground as thin as desired.

Surgical Procedure

Under local anesthetic the remaining upper anterior teeth are extracted preparatory to delivering the denture. The amount of surgery necessary will vary greatly, depending on individual conditions. In some cases no surgery is necessary: where there is no protrusion or where the tissue is short, or in the presence of severe periodontoclasia.

Conservative Measures—In cases where some reduction must be done as shown in Figure 1 a conservative method is employed which preserves the cortical labial plate: (1) No flap is made and the periosteum and mucosa are not separated from the bone but are left untouched. (2) The sulcus depth is not shortened because the soft tissue is never detached from the bone. (3) Only the interdental papil-



10. The interdental septum is removed in cases where much reduction is necessary. The gingiva and mucosa are not detached from the bone. All reduction is done behind the labial cortical plate.

11. A cut through the thin bone over the cuspid is made to give room for the cortical layer to be moved back.

12. With chisels, the cortical plate is freed. The operator is shown lifting the cortical plate labially to show that it is free.

13. The cortical plate is pressed lingually. The labial and lingual gingiva will approximate.

14. A pucker is removed by cutting out a small "Y."

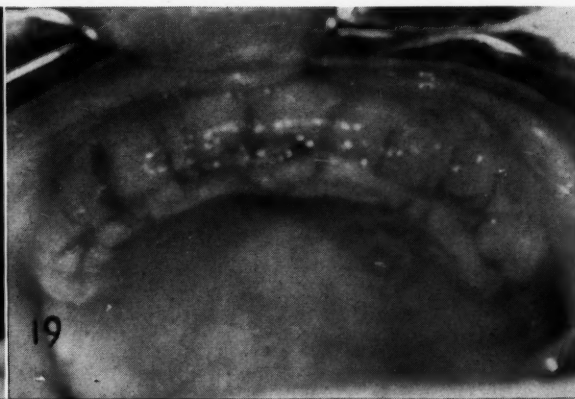
15. Suturing is preferred. There should be no tension on the sutures.

16. With the tissue sutured the immediate denture is ready for the try-in.

17. An indicator material such as Kerr's Sortec® is painted in the denture. Pressure spots are relieved. This step is repeated twelve or fourteen times until pressure is even.



18. The completed immediate denture and a satisfied patient.



19. Appearance of tissue on the fourth day. Sutures are removed.

lae, not the margin of the tissue is trimmed away.

Instruments Used—The few instruments used in this method, except the lancet and suture needle forceps, are shown in Figure 9.

Bone Fragments Retained—In some cases where the tissue is shallow it may be necessary only to bevel the interdental septum toward the labial. These bone fragments that are attached to the periosteum are not removed but are left to become a part of the newly shaped tissue.

Bone Moved Lingually—In cases where there is more undercut as shown in Figure 1, and there is a pronounced cuspid eminence, the reduction is made lingual to the labial cortical plate of bone and this bone is moved lingually. This measure amounts to minor plastic surgery.

Steps in Surgical Procedure — 1. With a pair of small tapering double cutting edge rongeurs (Fig. 9A), remove the interdental septum, and trim the interdental papillae smooth with lancet or scissors.

2. Remove the septum as high up as possible (Fig. 10). With a chisel cut through the thin bone distal to the cuspid socket to provide room for the bone to move back.

4. Bevel the bone distal to the cuspid. Do not remove bone fragments; leave them to become a part of the new tissue shape.

5. If the labial plate cannot be pushed back with finger pressure, free the plate by placing the chisel on each septal remnant with the bevel to the lingual to direct the chisel to the outside.

6. When the cortical plate of bone

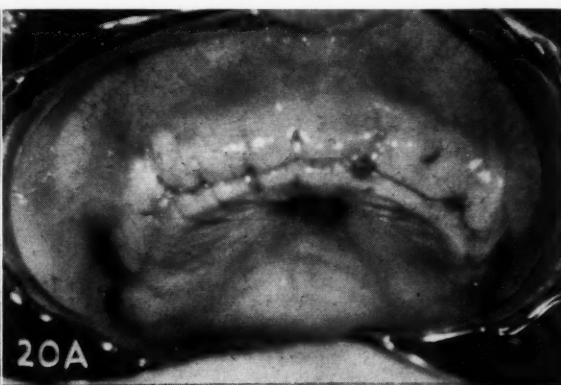
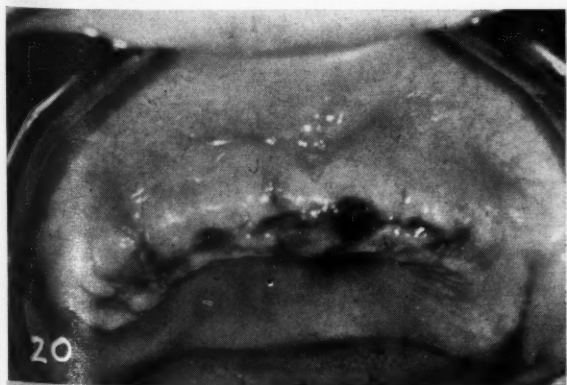
is free (Fig. 12) it is pressed lingually, (Fig. 13) and sutured, (Figs. 15 and 16).

7. As the tissue is pressed lingually there is likely to be a pucker distal to the cuspid.

8. With a lancet (Fig. 14) cut out a little wedge-shaped piece of tissue so that it will be smooth.

9. If there is a prominence in the cuspid area after this step it may be necessary to remove the septum distal to the cuspid so that bone can be pushed in. This may be necessary if the bicuspid teeth have only recently been extracted.

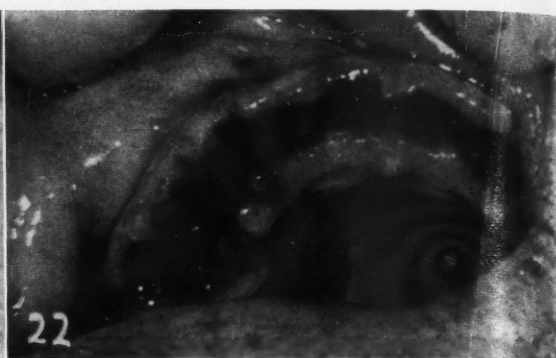
Removal of Low Frenum—If there is a low attached labial frenum it can be corrected at this time by cutting down on each side of it to the bone. Scissors can be used to cut it out at the top. One suture placed across this



20 and 20A. Other cases on the fourth day when sutures are removed.



21. Conservative surgery in the posterior part of the mouth. Severe periodontoclasia on the lingual leaves only the buccal plate with a pronounced undercut. If the plate of bone were removed the patient would have less tissue.



22. The septum is removed with rongeurs. The buccal cortical plate is then freed with chisels, sectioned in the cuspid area, pressed lingually, and sutured.

will be sufficient. This measure may be extremely helpful in aiding retention and making a stronger denture. This slight operation frequently should be done.

Method Used in Posterior Area—The method of reducing the process called by Dean¹² Intra-Septal Alveolotomy and described by Wood¹³ can be used in the posterior area of the mouth (Fig. 21). As shown in the illustrations, there were severe destruction and recession of the lingual gingiva. There was a pronounced buccal protrusion of the cortical plate of bone. The buccal septa were removed (Fig. 22).

Bone not Removed — This whole plate of bone with its attached gingiva and mucosa was tilted lingually and sutured. The healed tissue is shown in Figure 23 as it appeared six months later. Had this undercut been relieved by cutting away the bone the patient would have had less gingival tissue.

Fitting The Denture

1. Paint the inside of the denture with an indicator such as Kerr's Sortec.[®]
2. Try the denture in the mouth, remove, and relieve the pressure areas. Do this repeatedly until the pressure is evenly distributed and there are no pressure spots. Figure 17 shows the pressure spots to be relieved.
3. Press the denture firmly in place with a rotary motion so the pressure areas will show up.

Correction of Possible Imperfections—If conditions are normal the denture will fit. It will stay in place and have an excellent appearance as shown in Figure 18.

If the denture drops, the anterior flange may be too long. Trimming it may stabilize the denture. If it does not, apply a little self-curing acrylic around the inside of the periphery, and postdam and seat. Remove the denture frequently and rinse the mouth and denture. If the master impression was excellent there will probably be no difficulty with the fit. Little adjusting of the occlusion is done at this time. Final, spot grinding and milling is completed about four days after insertion of the denture.

Care of the Mouth After Insertion of Immediate Dentures

Opinions differ about after care. Denen¹⁴ and Harris⁶ suggest leaving

dentures in for forty-eight hours. Sears¹⁵ suggests that they can be left in for three days before removing. Gieler⁵, Hardy¹⁶, and Hughes¹⁷, suggest leaving them in twenty-four hours before removing. Jordan¹⁸ suggests they be removed hourly and cleansed. In the author's opinion immediate dentures should be removed every two hours, cleansed, and rinsed with antiseptic. The mouth is also rinsed and the dentures are replaced with a trace of the antiseptic on the denture and in the mouth.

Use of Antiseptic—The antiseptic is used to minimize odors. There is less swelling when dentures are moved

¹²Dean, O. T.: Intra-Septal Alveolotomy, Washington D. J. **22**:7-23 (October) 1953.

¹³Wood, Karl Hayden: Alveolotomy, J. Oral Surg. **10**:239-246 (July) 1952.

¹⁴Denen, Harry E.: Immediate Dentures, Illinois D. J. **4**:181-188 (May) 1935.

¹⁵Sears, Victor H.: Immediate Denture Restoration, JADA **10**:644-647 (July) 1923.

¹⁶Hardy, Irving R.: Immediate Maxillary Dentures, DENTAL DIGEST **41**:50-56 (February) 1935.

¹⁷Hughes, Frank C.: Immediate Denture Service, JADA **34**:21-26 (January) 1947.

¹⁸Jordan, Luzerne G.: Immediate Dentures, JADA and D. Cosmos **25**:868-884 (June) 1938.



23. Appearance of the mouth after six months.

frequently and the mouth washed and bathed copiously with saline solution. Figures 20 and 20A show two cases on the fourth day when sutures were removed.

Aid to Rapid Healing—By leaving a matrix of bone for the growth of new bone in the extraction area, healing is more rapid and the result is smoother because the septa are not

left exposed. There will be less shrinkage later because the spongy, softer bone is not left to serve as a matrix. There will be no sequestration of this bone as might be expected.

Summary

A method of taking alginate impressions for immediate dentures is described. The surgical reduction of

the alveolar process is simplified by moving the labial cortical plate back, rather than cutting it away. There is less atrophy of the tissue because the cortex is preserved.

The dentures are cut to fit the ideally shaped tissue rather than cutting the tissue to fit the dentures.

Tahoka, Texas

The Tongue as a Site of Injections

IN THE treatment of unconscious or anesthetized patients the intravenous injection of a stimulant or of antidotes is often desirable to ensure the rapid onset of action. In children and the obese, however, it is often difficult to find a vein. Intramuscular injections may take as long as 10 minutes to become effective. It is therefore advantageous to inject into any highly vascular organ whenever possible and in this connection, it has been common practice to inject oxytocic drugs into the uterus after cesarean section.

Procedure

John Bullough, Consultant Anes-

thetist to the Dartford Group of Hospitals, reports in the January 1958 issue of *Lancet* his use of the tongue as the site for injection. Although the injection may be made into any part of the tongue, he inserts the needle via the ventral surface because bleeding after withdrawal of the needle is less common there. The two veins on either side of the midline should be avoided. The onset of action takes only from 40 to 90 seconds.

Amounts Used—Volumes up to 2 centimeters may be injected. If a sharp needle, size 16-18, is used, bleeding is uncommon on withdrawal.

Needle May be Left in Situ—In anesthetized patients the needle may

be left *in situ*, according to this authority, for serial injections of analgesics.

Indications

The method can be used with advantage in the treatment of any unconscious, comatose, or collapsed patient, whether from disease, injury, or drugs. The intraglossal route may be used for most drugs, except barbiturates, solutions of tubocurarine, and phenothiazine derivatives. The intraglossal route for injections has been used during the last 5 years without a mishap. It is recommended to both general practitioners and anesthetists.

Adapted from Reports, *Medical Science* 3:141 (Feb. 10) 1958.

Developments Influencing Dental Health in America

C. C. BASS, M.D., New Orleans

Universal Disease of Man

Less than 25 per cent of the loss of teeth in this country results from caries; more than 75 per cent from periodontoclasia. Periodontoclasia begins in childhood and is a universal disease of man. Everyone has lesions of some stage of activity and advancement, which can be demonstrated by proper microscopic examination. If they live long enough, virtually all people sooner or later lose their teeth from this disease. It prevails among people of all races and in all levels of civilization, the rate of progress

being influenced by the oral hygiene habits and methods of the individual person. It affects the most cultured and intellectual people of the world and even more severely, the primitive races, including the African bushman whose habits and characteristics, in many respects, are more like those of lower animals than of man.

Caries Related to Fermentable Carbohydrates in Diet

The initiation and progress of the lesions of caries also are influenced

largely by the effectiveness of personal oral hygiene habits. Few people know and accurately follow the exact method which must be followed to prevent caries. Consequently, almost all people in this country have a certain number of lesions, and most of these tend to progress in time. Many of the teeth in which caries lesions originated in childhood are ultimately lost, however good the dental service may be. This can be prevented only by preventing the lesions before they start.

Adapted from *Journal of the Louisiana Medical Society* 109:203 (June) 1957.

Maintaining the Psychophysiologic Equilibrium of the Patient in Relation to the TEMPOROMANDIBULAR JOINT

ARNOLD R. GREENE, D.D.S., Encino, California

DIGEST

The physician encounters many patients with earaches, headaches, dysmenorrhea, excessive nervous tension, physical fatigue, cervical neuralgia or condylar pain, for which in some cases, a definite cause cannot be found. All the required physical tests are made but the final diagnosis is not attained. Vitamin therapy, special diets, or anodynes may be prescribed but neither the physician nor the patient is satisfied. This article presents a possible solution to this medical problem. The data included were collected by the author over a period of several years and are concerned with the dysfunction of the condyle in the glenoid fossa of the temporomandibular joint as a result of an improper bite.

Functional Movement of the Condyles

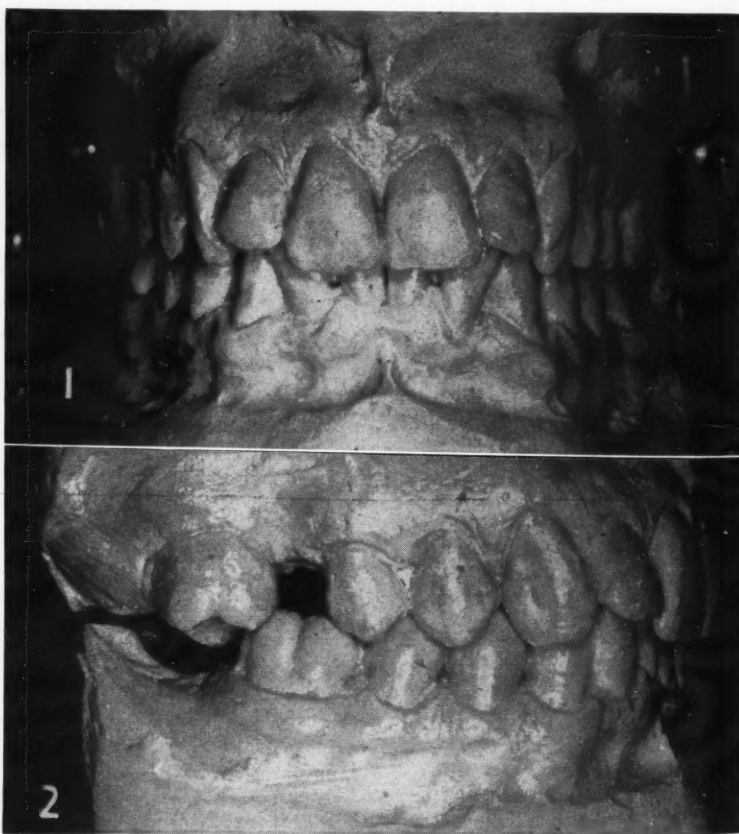
Although there are differences of opinion concerning movements of the condyles in their fossae, the present consideration is the following:

1. The condyles normally rest in the glenoid fossae. The action of this joint is influenced by the position of the teeth, *natural or artificial*, on or in the mandible or maxillae.
2. When the teeth are in ideal position and interdigitation, the mandible moves freely during mastication, and the condyles rotate in their fossae without trauma.
3. When the upper and lower teeth do not occlude properly, and the bite is locked by the excessive overlap of

fossae, and is caused by "the locked bite."

The Closed Bite—Equally important as traumatic influence is the *closed bite* condition where the molars and bicusps have not erupted sufficiently, thereby retaining the intra-oral vertical space less than normal. An illustration of the result of a closed bite is that of a patient who removes his dentures and then closes

the upper buccal cusps over the lower buccal cusps, the mandible cannot glide smoothly, and the height of the cusps is lowered each time the patient moves his teeth to the right or left. This dropping and rising over the cusps causes a similar traumatic movement of the condyles in their



1. Anterior view of study models illustrating a completely locked bite. This patient cannot move in any direction until he separates his teeth.
2. Side view of study models showing the completely locked bite. This tooth relationship prevents lateral movement.

his mouth. The distance between the tip of his nose and the tip of his chin is reduced. This reduction causes a forward and upward movement of the mandible forcing the condyles against the anterior wall of the fossae.

Combination of Incorrect Bite Conditions—In combining the two bite conditions which represent the majority of improper bite cases, it is possible to visualize the discrepancy that occurs during the process of swallowing, chewing, and bruxism: the fossae begin to enlarge from constant trauma, and subluxation in varying degrees results.

Medical Theory from Dental Procedures

The physiologic and abnormal movements of the temporomandibular joint in relation to traumatic occlusion have been described. The following discussion is an explanation of causes of the nondental symptoms that have appeared. All treatment for bite correction has been made on the basis of the correction of the dental defects and was intended to prevent, or to render static any periodontoclasia. The corrections were not made on the basis of medical treatment, but solely on the basis of dental treatment. In the course of these dental procedures patients have volunteered the medical information presented here.

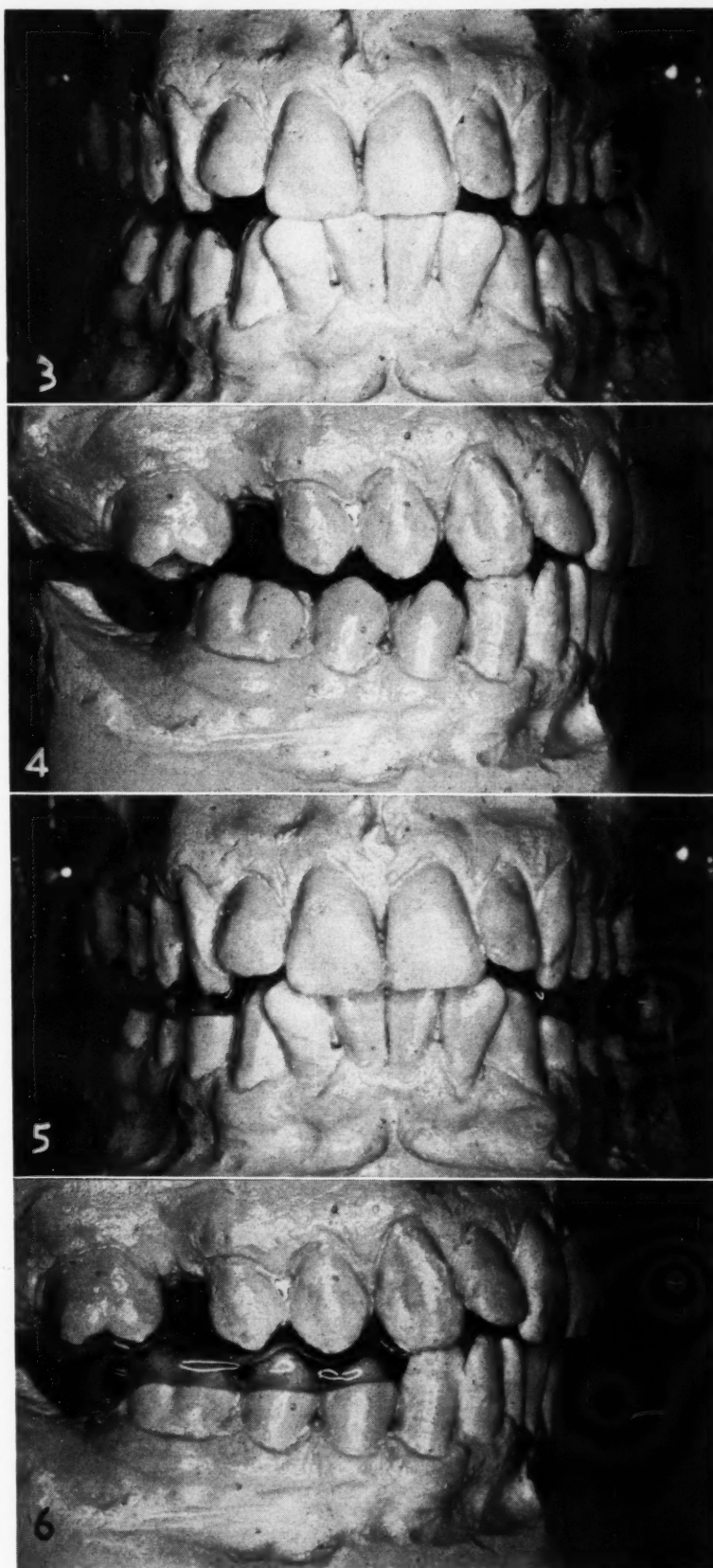
Involvement of Trigeminal and Vagus Nerves—The relationship of

3. Anterior view of models showing posterior teeth widely separated when the bite is in protrusion.

4. Side view of models showing a lateral excursion illustrating interference and trauma in the cuspid area with spaces between the posteriors.

5. Anterior view of models in protrusion showing an acrylic bite plane over the lower posterior teeth. Notice that the posterior space in Figure 3 is now closed and the teeth are in contact with the bite plane.

6. The acrylic bite plane is in place and the patient's lateral movement is simulated. Notice that there is no cuspid interference as shown in Figure 4. The lateral position now has occlusal balance.



the temporomandibular joint to physical distress, as distinguished from dental discomfort, can be explained on a basis of neurology, specifically, involvement of the trigeminal and the vagus nerves but not necessarily limited to these nerves.

Irritation Transferred to Skeletal System—It is accepted that pain sensations are highly developed in the voluntary nervous system, but not in the autonomic or vegetative system. Since afferent visceral nerves are not exposed to pain sensations caused by external influences, they have failed to develop a keen sense of pain. However, since the cell bodies of the afferent visceral nerves and the skeletal sensory nerves are in juxtaposition and segmental relationship in the central nervous system, irritation of the less sensitive visceral system is transferred to the highly sensitive skeletal system. Thus the somatic system, highly sensitive, expresses pain by transfer from irritations arising in the visceral structures.

It is common knowledge that viscera do not react painfully to tearing or pinching. This can be demonstrated easily in any operating room. Observations in this field were first reported by Ross,¹ MacKenzie,² and Head.³

Correlation by Authority—In reference to the topic introduced herein is a statement by Pottenger: "Visceral pain, at least that which is pronounced, is a pain caused by stimuli arising in an internal viscus which is referred and felt in the area supplied by a skeletal sensory nerve. The perception centers are made aware of it in the same manner as they are made aware of somatic pain, but instead of perceiving the pain as occurring in the viscus they recognize it as being in the sensory skeletal nerves. The referred pain from the viscera is produced by transference of the sensory impulse from the afferent fibers of the sympathetic nerves to the spinal sensory neurons in the same segment; [*italics mine*] and from the vagus afferent neurons to the sensory neurons of the 5th cranial nerve (*trigeminus*). Visceral pain thus expresses itself in sensory spinal nerves and the 5th cranial nerve."



7. Occlusal view of a bite plane of clear acrylic and a contoured steel bar. This is the first and temporary plane for the patient.

8. This is a view of a permanent bite plane made of metal and faced with tooth-matching acrylic windows for esthetics.

Expression of Dysfunction

Since irritation of the vagus nerve can transfer to the sensory fibers of the trigeminal nerve, it must follow that stimulation on any portion of the 5th cranial nerve can be transferred to the 10th cranial nerve, and express itself in the dysfunction of any viscus or viscera of the autonomic nervous system, with consequent pain.

Despite this scientific information on neurology, specific facts of cause and effect on the temporomandibular disorders are not stated, but rather a possible explanation for some medicodental problems is suggested.

Specific Conditions Improved—In the process of opening bites and balancing traumatic occlusions according to the principles of normal natural dentition, patients have experienced complete relief in one or more of the following conditions after bite correction: (1) Menstrual discomfort. (2) Cervical neuralgia. (3) Headaches. (4) Fatigue. (5) Ear-

¹Ross, J.: On the Segmental Distribution of Sensory Disorder, *Brain* 10:333, 1887.

²MacKenzie, J.: Some Points Bearing on the Association of Sensory Disorders and Visceral Disease, *Brain* 16:321, 1893.

³Head, Henry: *Studies in Neurology*, London, 1920, Oxford Univ. Press, Vol. 1, p. 63.

⁴Pottenger, F. J.: *Symptoms of Visceral Disease*, ed. 7. St. Louis, C. V. Mosby Company, 1953, pp. 173-174.

aches. (6) Irritability. (7) Neck pains. (8) Nasal allergies. (9) Eustachian tube closure. (10) Excessive perspiration. (11) Constipation. (12) Unusual frequency of urination, particularly nocturnally.

Other Causes may be Involved—In the etiology of the disturbances listed, other factors may be involved but

when a patient has had unsuccessful medical treatment, and no solution to the problem is offered he definitely will be helped by proper bite correction.

Conclusion

Examination of innumerable mouths has demonstrated that at least

95 per cent of the patients required some correction, ranging from complete mouth rehabilitation to spot grinding of the teeth. In the treated cases, despite the degree of correction needed, even a small amount of spot grinding improved the patient's comfort.

16603 Ventura Boulevard

What Can a Doctor Do?

WHEN THE layman feels tense, unhappy, lonely, rejected, depressed, or browned-off, all he needs to do is to say to himself: "I've got a pain under my ribs. It's probably the old ticker again. I'll just pop round to see my doctor." . . . The doctor tells him his heart is quite all right. All that's the matter is that he has been working too hard, taking life too seriously . . . The doctor pats him on the back and the patient goes away twice the man.

But what can a doctor do when he feels fed up? He can try saying all those things to himself, but they sound hollow and unconvincing that way. Or he can consult a colleague, but colleagues are too fond of order-

ing uncomfortable barium meals and painful biopsies.

I overcome the difficulty from time to time by finding something wrong with my mouth—usually cancer. I go to my dentist, have my teeth polished, and then just before I get up from the chair I ask casually: "By the way, I suppose this is nothing here?" He looks and then says: "That's just a muscle attachment—you've got one on the other side just the same." . . . But I can't be forever having my teeth polished, so very often I drive out to a little village store—the comprehensive kind catering not only for the household but also for the sick body. The proprietress beams at me

across the counter between a pyramid of soapflakes packets and a cardboard structure advertising disinfectant.

"What is it today, Sir?" she asks.

"Indigestion," I say. "Awful nagging pains just under my ribs here. Oh I do feel poorly."

"Yes, you're looking very tired too, Sir. I expect you've been working too hard. What you need is a tin of these Wallopo Fruit Salts. They'll put you right in no time."

And they do.

From a Running Commentary by Peripatetic Correspondents, *Lancet* (July 27) 1957, in *Journal of the American Medical Association* 165:44 (Dec. 21) 1957.

Inorganic Bone is Successful in Jaw Defects

INORGANIC bone matrix has been used successfully to treat maxillary and mandibular bone defects in more than 20 patients by members of the Oral Surgery Department at the University of Michigan. In no case did use of inorganic bone matrix result in postoperative complications.

The study of these grafts is said to cover the largest trial in human beings of inorganic bone matrix prepared by the ethylenediamine extraction of beef bone. Defects treated include removal of impacted teeth, apicoectomies, cyst enucleation, and removal of central giant-cell tumors.

Serial x-rays, starting prior to insertion of the grafts, showed a gradual disappearance of the dense bone that lined cyst cavities over a period of four weeks.

Adapted from *Scope* 2:1 (Nov. 6) 1957.

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GNATHOLOGIC and PERIODONTAL Concept

in Oral Rehabilitation—Part Two

LEWIS B. UDIS, D.D.S., and EDWARD L. UDIS, D.D.S., Philadelphia

DIGEST

In this article, which is the second in a series of three, step-by-step techniques are presented for the preparation of soft tissue and teeth in oral rehabilitation. Procedures are described for (1) gin-

givectomy, (2) temporary acrylic splinting, (3) temporary gold splinting, and (4) the use of orthodontic appliances. In the final installment, techniques will be detailed for the completion of an oral rehabilitation case.

Periodontal Concept

The philosophy of treatment in oral rehabilitation requires the total elimination of the periodontal pockets, with reattachment of fibers and regeneration of alveolar bone. The rationale behind this philosophy is created by the nature of the restorative techniques employed. The margins of the restoration are terminated in the



18. View of completed gingivectomy.

19A and 19B. Surgical pack is placed in position for

one week and repacked for an additional week during the initial healing.

20. Postoperative view of gingivectomy.

gingival sulcus, avoiding irritation to the supporting tissues. If these margins are extended into existing pockets, however, a situation is created that can only lead to further destruction of the periodontium. It is, therefore, essential to eliminate all pockets and to achieve a physiologic gingival architecture. This is the basic concept of the required periodontal treatment in oral rehabilitation.⁴

Periodontal Diagnosis

The presence of a degenerative process, occlusal trauma, with a periodontitis was the etiology of the existing periodontal breakdown in the case discussed. Mobility was present, due to secondary trauma.

Measures Indicated — Eradication of the periodontal and intrabony pockets and stabilization of the mobile teeth were planned.

Reparative Capacity Evaluated — The resistive and reparative capacity of the patient was evaluated and found satisfactory.

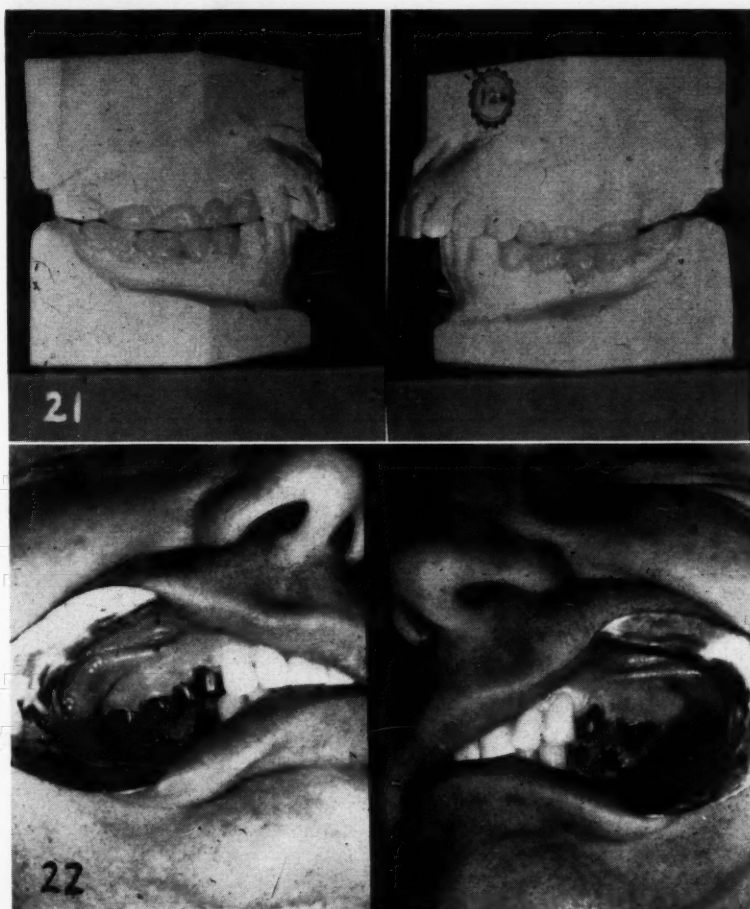
Treatment Procedure Chosen — Gingivectomy was selected as the treatment necessary to attain the complete eradication of the periodontal pockets. Subgingival curettage was instituted as the treatment of choice for the intrabony pockets.

Inflammation Eliminated — All available diagnostic aids were utilized. The treatment consisted of (1) thorough scaling, (2) subgingival curettage, and (3) planing prior to gingivectomy. This procedure eliminated inflammation.

Subgingival Curettage—The intrabony pockets were eradicated with subgingival curettage and reattachment was attained.

Surgical Intervention a Possibility —If the technique applied had failed to eradicate the pocket, it would have been necessary to resort to surgical intervention with osteoplasty and gingivectomy, removing the alveolar bone occlusal to the pocket. Choice of periodontal treatment must be selective, employing the technique indicated (Figs. 18, 19, and 20).

Discussion of Technique of Gingivectomy —Gingivectomy was completed after the subgingival calculus



21. Right and left view of acrylic splints.

22. Right and left view of prepared teeth.

was removed and the subgingival curettage and planing were completed. The following steps were taken:

1. The gingival tissue side of the pocket was removed to the base of the pocket to include the epithelial attachment.

2. A portion of connective tissue was left above the alveolar crest. This permitted the tissue to be contoured to a physiologic form which would not be possible if the tissue were removed down to the bone level.

3. The technique of gingivectomy should consider the necessity for gingival contouring as well as elimination of the pocket.⁵

4. The depth of each pocket was marked and used as a guide for the incision.

5. The extent of the bevel was determined by the thickness of the tissue. The knife was placed to compensate for the bevel.

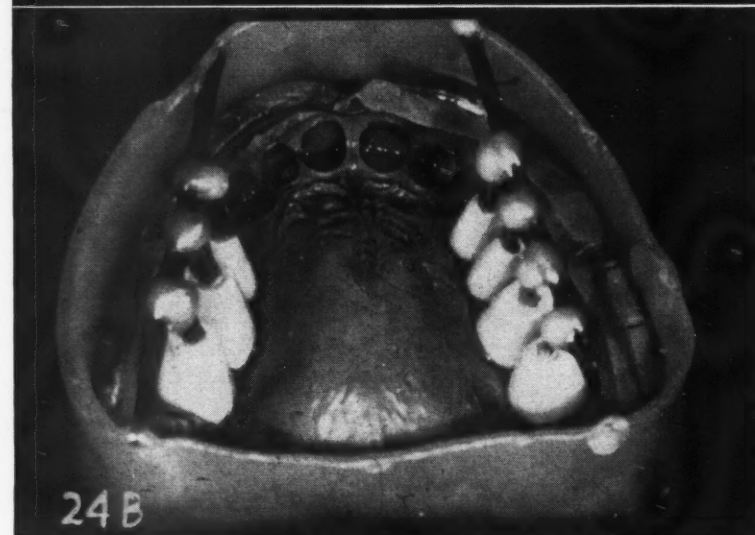
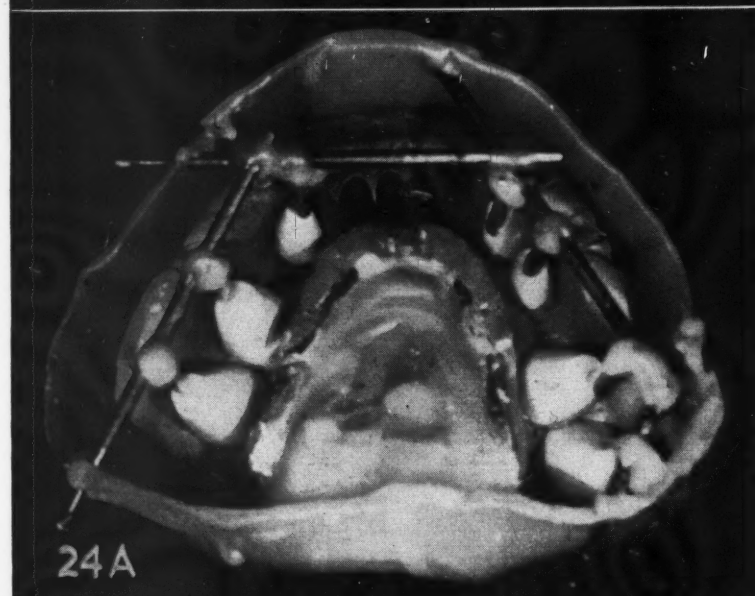
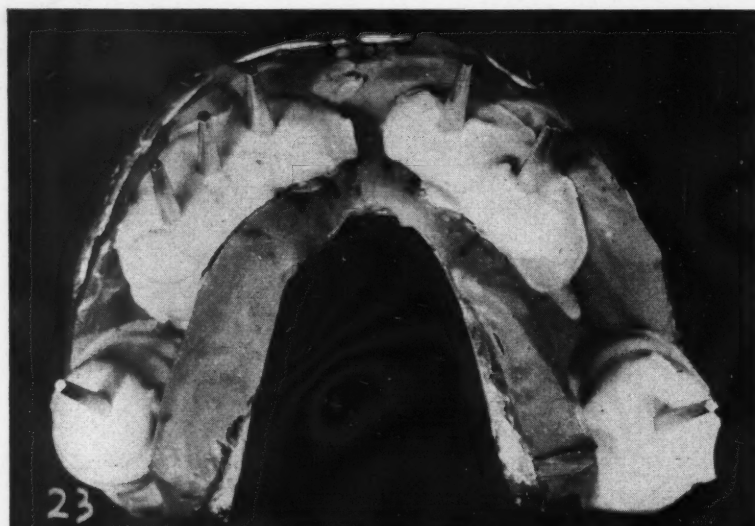
6. The cut was made straight across, undulating at the proximal areas to produce a groove.

7. An interproximal knife was used to join the incision interproximally, to connect the buccal and lingual surfaces, and to free the incised tissue. The interproximal knife was placed in an angulated position to continue the bevel.

Desired Architecture Achieved — This properly contoured gingiva

⁴Udis, Edward L., and Udis, Lewis B.: New York J.D. 27:221-227 (June-July) 1957.

⁵Goldman, H.: Periodontia, Ed. 2, St. Louis, C. V. Mosby Co., 1949.



achieved the desired architecture with cone-shaped papillae.⁶

Placement of Surgical Pack — All debris, tissue tabs, and blood clots were carefully removed. The tissue was washed with warm saline solution and dried in preparation for the placement of surgical pack. After one week, the area was cleansed and repacked for a second week. The pack prevented proliferation of the epithelium and reduced postoperative symptoms (Figs. 21, and 22).

Acrylic Temporary Splints

The mobile teeth were stabilized and the prematurities were eliminated with the temporary acrylic splints. This eliminated trauma and stabilized the mobile teeth, which aided the reattachment of fibers and the regeneration of the alveolar bone.

Preparation of the Teeth

The final preparation of the teeth was not begun until after the initial healing of the tissue. Caries was removed and preparation of the teeth completed. With the gingivectomy completed, the former subgingival margins were more readily accessible and could be thoroughly prepared and restored (Figs. 23, and 24).

Final Evaluation for Completion of Rehabilitation—The tissue and teeth were ready for the completion of the final restorations in twelve months. At that time the teeth responded favorably to radiographic and vitality examination. All pockets and mobility were eliminated and a physiologic gingival architecture was achieved (Figs. 25, 26, and 27).

Discussion of Figure 27

The temporary gold restorations shown were fitted loosely to facilitate their removal. They were placed with temporary cement and removed periodically. The margins were terminat-

⁶Udis, Lewis B., and Udis, Edward L.: Film, Surgical Preparation of Soft Tissue in Oral Rehabilitation, Philadelphia, 1954.

23. Preparation for individual dies for temporary gold castings.

24A and 24B. Completed individual dies for temporary gold castings.

25. Completed casts with individual dies in position.

26. Articulated casts with removable individual dies for temporary restorations.

27. Completed temporary gold restorations with activated orthodontic appliances.

ed short of the gingival sulcus to facilitate the healing process. Buccal tubes were placed in position to accommodate the orthodontic appliance.

In the third article of this series, techniques for completion of a representative oral rehabilitation case will be discussed.

5409 Germantown Avenue

Can Radiation Cause Thyroid Cancer?

B. J. DUFFY, JR., M.D.,
Washington, D.C.

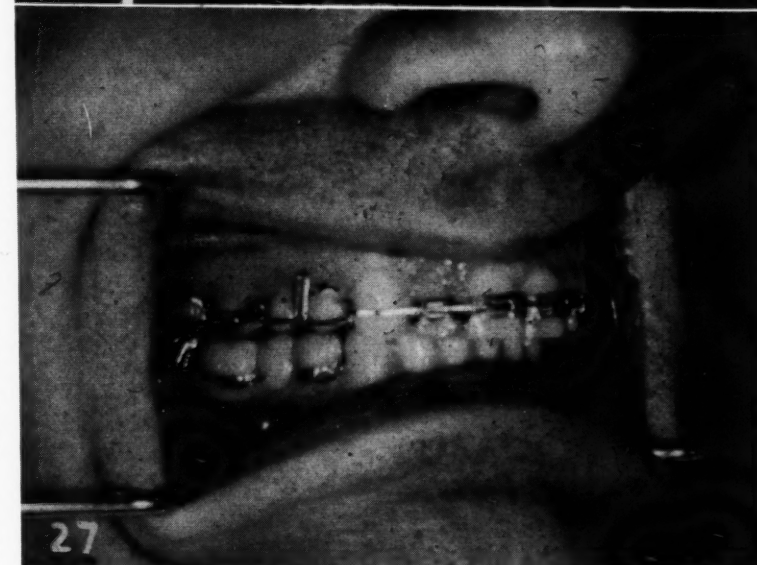
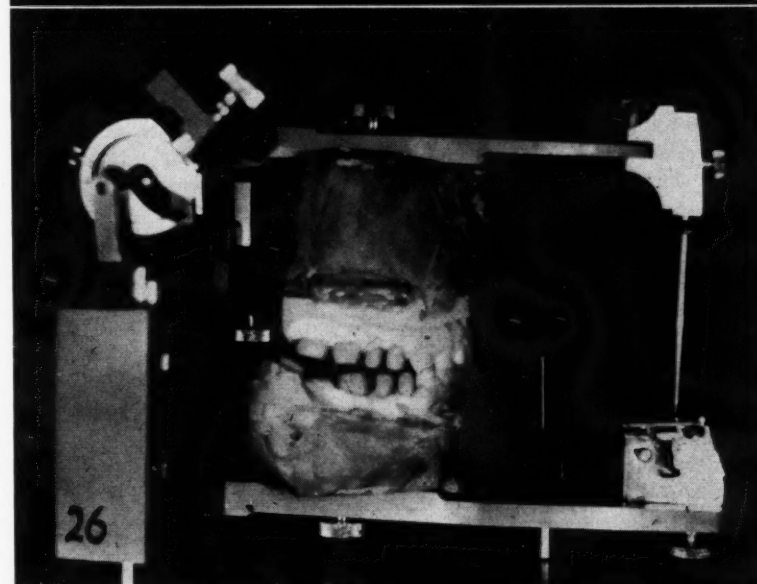
Summary

There have been repeated reports indicating an association between therapeutic x-irradiation of benign disease in childhood and the later development of thyroid cancer in a small, but highly significant, number of the children so treated.

The experimental work indicates that the administered irradiation is potentiated by endogenous endocrine activity, in the development of thyroid cancer. Such a mechanism may account for the increased risk after the use of x-rays in the infant or growing child, compared to that in the adult.

This review of clinical and radiobiologic data on the relationship between radiation and thyroid cancer suggests: 1) restriction of the use of I^{131} , including tracer doses, in the young patient until results of further studies of radiation carcinogenesis in the neonatal and childhood period are available, and 2) no restriction of the use of therapeutic doses of I^{131} when indicated in the adult patient, since there is no evidence, clinical or experimental, that radiation can cause cancer in adult thyroid tissue.

From *Journal of Endocrinology and Metabolism* 17:1387 (Nov.) 1957.



STRESS and the Diseases of Adaptation*

Part One

ANDRÉ ROBERT, M.D., Ph.D., Kalamazoo, Michigan

DIGEST

Most medical discoveries have been limited to a particular field of disease, for example, the discovery of the pathogenic role of a new microbe or the explanation of a biochemical phenomenon. Research on stress and the diseases of adaptation, however, has expanded so much during recent years that this subject now involves medicine as a whole. This article determines the position of this new concept among some of the theories which have been proposed to explain the nature and origin of disease and summarizes the nature and mechanism of the nonspecific reaction.

Evolutionary Aspects of Medical Concepts

Medical treatment for centuries has been empiric. It was learned that extracts from plants could be administered for all kinds of disease. Certain drugs acted selectively in certain maladies, for example, extracts of digitalis in cardiac failure, whereas other measures such as blood letting and drastic purgatives, were used for various disturbances.

Experimentation and Specificity—During the last century, two men revolutionized the theories of medicine. Claude Bernard introduced rigid and scientific methods to study biologic phenomena, showing how to

conduct sound experimentation. Louis Pasteur demonstrated the existence of specificity in the causes of infectious diseases. It can be said that twentieth century medicine is founded on the principles established by these two scientists.

Theory of Body Response Formulated—During the last twenty years, Hans Selye has demonstrated some defense mechanisms previously ignored and has formulated a theory according to which the response of the body to various aggressive agents follows two pathways:

(1) The specific reaction which is particular to each agent is elicited only in the presence of this agent. For instance, high temperature causes a burn, epinephrine produces tachycardia.

(2) Every agent exerts also another influence which is not specific but common to all conditions causing some sort of damage. This latter effect is nonspecific since it does not take into account the nature of the stimulus.

The General Adaptation Syndrome (G-A-S)

In 1936, Selye engaged in experimental research on endocrine glands with particular attention to ovarian hormones. At that time, following earlier studies, he was inclined to believe that the ovary, in addition to the estrogens and progesterone, would secrete a third hormone endowed with different properties. In order to test this hypothesis, he administered daily to ovariectomized rats ovarian extracts prepared from the glands of other animals.

Dramatic Effects Obtained—The

rats were sacrificed after a few days in order to determine if the treatment had produced any visible organic change. The results were striking. Not only were the extracts active, they had produced dramatic effects: (1) The thymus was almost completely resorbed; (2) the stomach was filled with a bloody fluid obviously coming from multiple gastric ulcers; and (3) the animals were in a severe catabolic state.

Exception to General Results—A notable exception to the generalized damage observed was that only the adrenal glands had increased in size and showed the aspect of an organ in full proliferation and activity. It was thus suggested that the ovarian extract really contained an active principle, a hormone whose properties were to act on the thymus, the stomach, and the adrenal glands.

Preliminary Experiment Extended—It was necessary to purify and identify this principle. The situation then became more complicated; the purer the extracts, the less active they were. In order to reproduce at will the syndrome characterized by the triad of signs mentioned above, (1) the thymic involution, (2) the gastric ulcers, and (3) the adrenal hypertrophy, it was always necessary to administer the crude extract originally used. The fact had to be accepted that even if an active factor was present in the ovary, the usual chemical methods to isolate it were inadequate.

Possibility of Error—At this point Selye wondered if he had not been the victim of an illusion. By reconstructing the observed facts, it was evident that the extracts were potent only if they were impure. Instead of postulating a new hormone, it was possible that the changes observed were precisely related to these impur-

*From the Department of Endocrinology, the Upjohn Company.

¹Selye, Hans: Stress, Montreal, Acta Inc., Medical Pub., 1950.

²Selye, Hans: The Story of the Adaptation Syndrome, Montreal, Acta Inc., Medical Pub., 1952.

³Selye, Hans: The Stress of Life, New York, McGraw-Hill Book Co., Inc., 1956.

ities. In other words, the body might be sensitive to the influence of impurities, even though these were deprived of any specific biologic activity.

New Hypothesis Tested Experimentally—Selye decided to administer intentionally to rats a variety of so-called impure substances or at least substances without any particular pharmacologic property. The first trial consisted of injecting formaldehyde subcutaneously every day. If his hypothesis were sound, he could expect to find the same pathologic changes that had occurred after injecting the ovarian extracts.

Hypothesis Confirmed—Autopsy of the animals demonstrated that the changes in the thymus, the stomach and the adrenal glands were identical to those observed after the injection of ovarian extracts (Figs. 1 and 2). Already the concept according to which the body exhibited a system of reactions, which were identical whatever the nature of the damaging agent, was beginning to take shape. This concept was thereafter verified for many other stimuli (1) exposure to low or high temperatures, (2) forced muscular exercise, (3) trauma, (4) infection, (5) injection of toxic substances, all of which elicited the same changes.

Response to Prolonged Trauma—The next step in the evolution of this theory was to submit an animal to a damaging agent for a longer period of time, since the previous experiments were of the acute type, lasting only a few hours or a few days. It was then noted that the changes observed early after exposure to a toxic agent were *reversible*. Essentially, the thymus regained its normal structure, the gastric ulcers disappeared, and the size and appearance of the adrenal glands tended to return to normal. This second phase, characterized by a relative return to the normal in spite of continued treatment, was not, however, permanent.

Reversal to Initial Picture—After a time, depending on the kind and intensity of stimulus, the initial picture reappeared, again the thymus involuted, the gastric ulcers were reactivated, and the adrenal glands increased in size and became red. The



1. Effect of fasting on body weight. Left: control rat, nonfasted. Weight gain: 19 grams in seven days. Right: rat stressed by fasting for seven days. Weight loss: 65 grams.

animal started to lose weight and finally died.

Three Phases in Organic Response

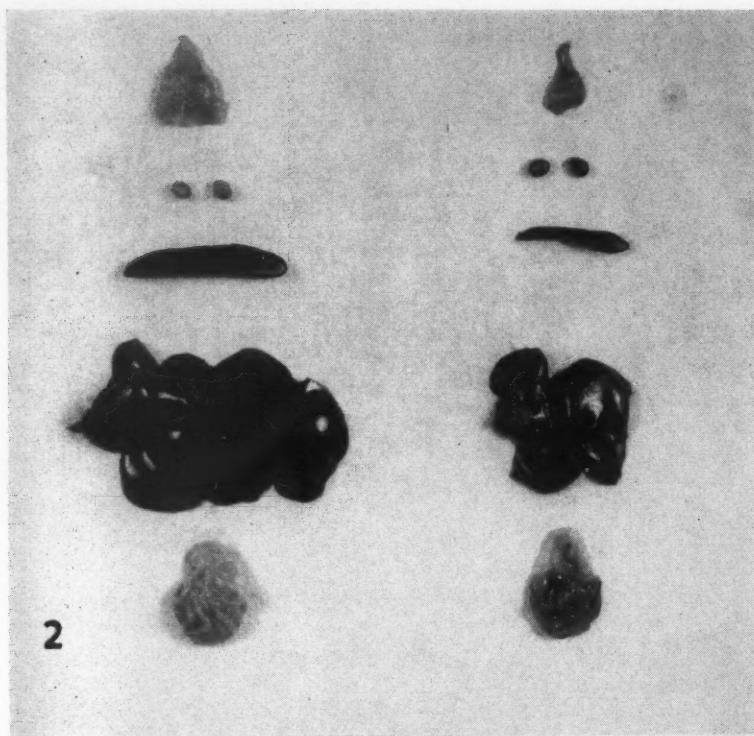
The conclusion was admissible that during exposure to damaging agents, the response of the organism corresponded to three distinct phases that Selye named: (1) the *alarm reaction*, (2) the *stage of resistance*, and (3) the *stage of exhaustion*.

Characteristics in Common—The first and the last stages have many points in common: In both there are catabolism, obvious stimulation of the adrenal glands, and the presence of

visible lesions in the thymus and the stomach.

Unlike Characteristics—These two stages differ, however, in their influence on the resistance of the body: the alarm reaction is soon replaced by a phase where the resistance is increased, while the exhaustion stage ends in the greatest possible diminution of resistance; that is, death.

Condition of Privilege—Between the first and last phases, the organism is in a privileged situation. Despite the fact that the aggressor is still attacking, the body has accumulated enough strength during the first stage so that it can now resist more power-



2. Effect of stress on the internal organs. These organs belong to the two animals shown in Figure 1. From top to bottom are shown the following organs: thymus, adrenal glands, spleen, liver, and stomach opened to show the mucosa. Left: control rat. Right: animal submitted to the stress of fasting for seven days.

All the organs of the stressed animal have markedly involuted with the conspicuous exception of the adrenal glands. These glands increased in size (it must be kept in mind that the animal on the right was smaller than the control at the time of autopsy) and their deep red color is an indication of increased secretion. Note the presence of multiple bleeding ulcers in the gastric mucosa.

The organic changes shown in this picture can be reproduced with any kind of stressor agent, such as formaldehyde, surgical trauma, infections, burns.

fully than before exposure of the stimulus.

Description of Syndrome—(1) Selye grouped these three phases under the name of *General Adaptation Syndrome*, or G-A-S (Fig. 3). The group is called a *syndrome* because it contains a variety of signs and symptoms. (2) The syndrome is *general* because it represents a reaction of the whole organism. (3) It is really an *adaptation* response because the outcome of this reaction is to allow the body to maintain its integrity even under unfavorable conditions.

The Concept of Stress

Out of these experiments described emerged the concept of stress. Because

of the wide use of this word, it is of the utmost importance to define correctly the concept which it represents: stress is a situation in which the organism is injured in some way by a noxious agent against which it reacts. The two essential elements of stress are the *damage* and the *defense* reaction.

Potential Stressing Factors—The quality of nonspecificity must be emphasized. Stress is by definition a nonspecific reaction. Innumerable agents (physical, chemical, psychologic) are potential stressing factors inasmuch as they can cause damage to the organism. Their nature can be extremely varied: stimuli of opposite natures, such as heat and cold, epine-

phrine and acetylcholine, muscular exercise, and forced immobilization, are stressing agents because they share equally the ability to trigger an identical stereotypical defense mechanism.

Specificity in Clinical Medicine—The widespread nature of stress explains why it was formulated only recently. One of the fundamental principles of clinical medicine is contained in the notion of specificity. Characteristic, recognizable signs of a disease are looked for in a patient; in other words, highly specific changes. Usually a disease is involved in a somewhat vague haze, poorly defined, although real. Some of the elements forming this mask may be the following: (1) the catabolic condition which accompanies most diseases; (2) the state of restlessness of the patient; (3) a slight elevation of temperature. All these conditions put together constitute the well-known picture which induce even a lay observer to state, "This man is sick."

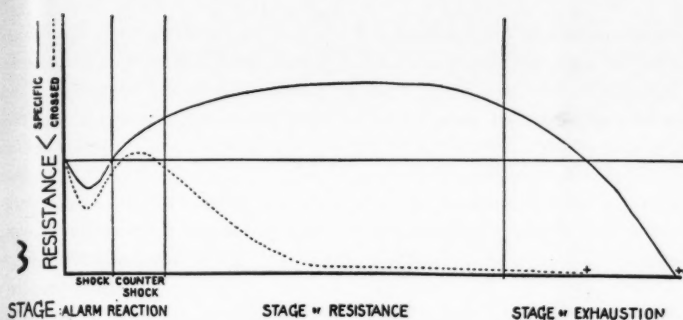
Scientific Approach to Symptoms—The physician, however, prefers to wait and is often forced to wait for diagnosis until more definite signs appear. These two attitudes cannot be weighed here but their comparison is an aid to explain why the concept of stress was discovered only recently. This is largely because the concept concerned a group of imprecise signs and symptoms, common to a great number of diseases and which, therefore, had no diagnostic importance.

Summary of Conceptual Values—It can be said that the concept of stress originated in the following:

(1) The discovery of new facts (the morphologic changes observed first in the adrenals, the thymus, and the stomach; many other changes were noted later).

(2) The integration of these new facts into a defense system put into action by the organism against any aggressor, whatever its nature.

(3) The rediscovery of nonspecific phenomena, many of which had been observed since time immemorial but were not recognized as such and were neglected as being without importance.



3. Schematic representation of the changes in specific (full line) and crossed (dotted line) resistance during the three stages of the general-adaptation-syndrome. The progress of time is indicated along the abscissa and the degree of resistance along the ordinate. Note that the specific resistance to the agent with which the animal is treated decreases during the shock phase of the alarm reaction and increases during the counter-shock phase, reaching its maximum during the stage of resistance; in the stage of exhaustion, it falls below normal and finally, death ensues. Crossed resistance, to agents other than that with which pretreatment occurred, falls even lower than the specific resistance during the shock phase, rises but slightly during the counter-shock phase and is definitely subnormal in the stage of resistance. This indicates that while resistance to one agent (specific) is acquired by pretreatment with this same agent, resistance to other stimuli (crossed resistance) falls below the normal level (horizontal line). (After H. Selye: *J. Clin. Endocrinol.* 6:117, 1946.)

Mechanism of the G-A-S

Once the concept of stress was formulated, its mechanism remained to be explained. The first few experiments left many questions unanswered.

(1) What was the role of the adrenals which were obviously stimulated during stress?

(2) Why did the thymus and lymphatic organs involute?

(3) How could the appearance of gastric ulcers be explained?

1. *Role of the Adrenals*—The adrenal glands appeared to be of primary importance during the stress reaction. The most direct approach to study their role was to observe the behavior of an animal exposed to a stressing agent after surgical removal of the adrenals. The results of such an operation were eminently clear. Adrenalectomy prevented the usual reaction to stress.

(1) The thymico-lymphatic organs remained intact.

(2) The blood lymphocytes and eosinophils did not decrease as occurs during exposure to stress of a normal animal.

(3) At the same time, the resistance of the animal was markedly diminished; death would supervene in the early stages, whereas an animal with its adrenals can live for months if the stressing agent is not too severe.

(4) Gastric ulcers were present even after adrenalectomy; the exact pathogenesis of the stress ulcers is still unknown.

From this crucial experiment it was possible to conclude that most of the changes observed during exposure of the organism to a stressing agent, with the exception of the development of gastric ulcers, required, in order to appear, a stimulation of the adrenal glands.

Adrenal Factor Responsible—In order to identify the factor responsible for these effects adrenalectomized animals were treated with adrenal extracts. After a short period of time (2 to 4 days) the animals were killed and were found to exhibit most of the organic changes which had been observed after exposure to a stressor agent.

Results Interpreted: It was believed

that stressing agents did not act only by themselves, but stimulated the adrenals to secrete substances which in turn were responsible for the observed lesions.

Hormones Identified: These hormones were identified later as being of the cortisone type and are now known under the name of glucocorticoids or *antiphlogistic corticoids*.

Distant Organs Affected—This was an important conclusion to reach, that is, a major function of the adrenals had been discovered by which these glands could affect many distant organs. Such a role had been until then totally ignored. The next problem was to determine what pathways the stressor agent followed in order to transmit its message to the adrenal glands.

2. *Role of the Hypophysis*—Shortly before these experiments were conducted, a connection had been established between the hypophysis (or pituitary gland) and the adrenals. It was known that after hypophysectomy the adrenals became atrophic. It was of interest therefore to discover how the adrenals would react to the action of a stressing agent after removal of the hypophysis. Would there still be a stimulation? Such an experiment revealed that the adrenals remained atrophic after hypophysectomy even though the animals were under the influence of various toxic agents. This simple experiment was of great importance for it allowed formulation of the following conclusions:

(a) A stressing agent needs the pituitary to reach the adrenals.

(b) Not only can the hypophysis maintain the adrenal at its normal volume, but it can also under conditions of stress induce an augmentation of this gland beyond its normal limits.

Relationship Established—A very close relation between the pituitary and the adrenals was thus established. These two glands appeared to constitute a functional unit which would work more or less, depending on whether the organism is exposed to damaging agents or is in a resting state.

Active Pituitary Principle Identified—By preparing extracts of the hypophysis and injecting them into hypophysectomized animals, it was found that only ACTH (AdrenoCorticoTrophic Hormone) had this property of adrenal stimulation. Administration of this hormone could reproduce the same changes as those seen after injection of adrenal extracts or after exposure of a normal animal to a stressing agent. It seemed evident that the secretion of ACTH and of adrenal hormones was not fixed, constant, but fluctuated according to the various situations in which the organism was involved.

Possible Involvement of Other Factors—The studies described elucidated most of the mechanism through which stress and the general adaptation syndrome develop. Doubtless other factors existed which escaped controlled investigation, and assuredly there are still others which play a role in the resistance to stressing agents; but they have not been thoroughly investigated and can be mentioned here only superficially. For instance, it is probable that the nervous system participates actively in the defense mechanisms; other endocrine glands, such as the pancreas, the gonads, and the thyroid may also contribute to them. Further research is needed to demonstrate their importance.

General Conclusions

From these studies the following conclusions can be drawn:

1. *A Normal Phenomenon*—The general adaptation syndrome is a *normal phenomenon*. The organism constantly faces difficulties. Mere daily work is an effort—who would deny that—which requires a certain degree of resistance. Generally speaking, the triggering of a stress reaction does not permit the system to be altered by external aggressors and therefore helps to maintain homeostasis. The beneficial role of the G-A-S becomes

even more obvious in consideration of patients having a deficiency of either the adrenal or the pituitary. These people are asthenic and cannot stand the slightest strain, whether it is in the form of muscular exercise, minor infection, or intense emotion. If such patients are not under treatment, they can even die because, in situations of stress, their glandular deficiency prevents the development of a G-A-S and therefore homeostasis cannot be maintained. That is why this reaction is not only normal but necessary for life.

2. *An Instrument of Adaptation*—The G-A-S is one of the means used by the organism to *adapt* itself to adverse situations. In fact, when the organism is attacked by noxious agents, quite often it does not have the power to eliminate these agents (such as cold, trauma, microbes, foreign bodies). It seems to be a general law of nature that when living organisms are facing adverse conditions that they cannot avoid, frequently the two can coexist provided the former transform themselves to the point that they are no more an easy prey. Against severe weather conditions solid shelters are built; forced to live with a bad-tempered person it is sometimes necessary to modify the attitude in order to find a suitable *modus vivendi*. This also appears to be true at the physiologic level: the body can cope with an aggressor by intensifying its own defense forces. The G-A-S constitutes a reserve of energy which upon liberation stimulates particularly the pituitary and the adrenals to secrete hormones which allow the organism to adapt in a nonspecific manner to any agent, however specific it may be.

3. *Adaptation Energy is not Inexhaustible*—Should the demand for adaptation be too great or too prolonged, the source runs dry and the body can no longer defend itself. This corresponds to the stage of exhaustion of the G-A-S during which the aggressor wins and which can be fatal.

4. *The Motion of Specificity*—There are, of course, a multitude of specific actions and responses. The following examples illustrate this point:

(a) A skin incision produces a solution of continuity in the tissues, breaks vessels, kills a few layers of cells, the whole process being characteristic of this type of trauma.

(b) A severely carious tooth induces the formation of an abscess with a thick capsule surrounding a certain amount of pus from which the microbe can be recovered. These two pathologic states are distinct, recognizable, and apparently have nothing in common.

Possible Development of General Reaction: In both cases, in addition to the local effect of the causative agent, a general reaction may develop which does not take into account the site where the injury was produced or the nature of the causal agent, and implies in the first place the participation of the pituitary and adrenal glands. It would, therefore, be incorrect to describe the effect of a cutaneous incision by saying that it consists merely of a cut and of local inflammation, or a dental infection by mentioning only the abscess produced.

Purely Local Reaction Nonexistent: The response of the organism *in toto* is an integrated part of the reaction to the damaging agent because there is no such thing as a purely local reaction. The body is not indifferent to what happens in its parts and in turn a local lesion can be greatly modified by a systemic response.

Complementary Concepts

In summary, these two concepts of specificity and nonspecificity, far from being mutually exclusive, are complementary.

(End of Part One)

301 Henrietta Street

Reduction of RADIATION HAZARDS

in Dental Radiography

JOHN A. CAMPBELL, M.D., Indianapolis, Indiana

DIGEST

This article is a digest of an address delivered by the author in October, 1957 before the Alumni Association, Indiana University, College of Dentistry. A summation of the effects of radiation on the population is presented and fifteen specific recommendations for reducing the hazards of dental radiation are outlined.

Mutagenic Effects of Radiation on Hereditary Material

For over thirty years such an authority as Hermann J. Muller has been trying to awaken the medical and dental profession to the harmful mutagenic effects of radiation on hereditary substance.

Effects of Diagnostic Radiology—Recent investigations by the National Research Council have shown that diagnostic medical radiology is much the most prolific source of artificial irradiation reaching the reproductive organs of the population, and that up to now the risk of genetic damage from test explosions of nuclear weapons is negligible.

Reappraisal of Diagnostic Methods Necessary—Present diagnostic methods should be reappraised from the genetic point of view to see how much can be done to reduce the applications of radiation in the healing arts to levels consistent with medical necessity.

Suggested Limitation of Lifetime

Dosage—In fact, it has been advised by the genetics committee of the National Academy of Science that persons up to the age of 30 receive a total accumulated lifetime dose to the reproductive cells from all radiation sources of not more than 50 roentgens and that for the total population, the average radiation exposure of the reproductive cells (above natural background) should be limited to 10 roentgens up to the age of 30 years.

Average Gonadal Dose Now Received—It is currently estimated that from conception to the age of 30 the average person in the United States receives the following gonadal radiation dose from different sources:

Natural background	3.0 roentgens
Nuclear weapons	0.1 roentgens
Medical x-rays	4.6 roentgens
Dental x-rays	0.1 roentgens

Minimum Radiation Dose Advised

—Dental x-ray exposure, as shown, contributes on the average to each person about the same as that received at present from atomic bombs. Nevertheless, in instances of careless or poor dental radiographic practice, the local and gonadal doses to a patient can become excessive, and it is therefore important to reappraise present diagnostic methods to assure that patients and technicians receive only the irreducible minimum of radiation essential to the task in question.

Cumulative Dosage a Problem—Because of the great benefit to patients, there is an ever-increasing demand for radiodontic diagnosis, so

that the problem of their cumulative dosage becomes similar to that for technicians and physicians.

Fifteen Practical Ways of Reducing Dental Radiation Hazards

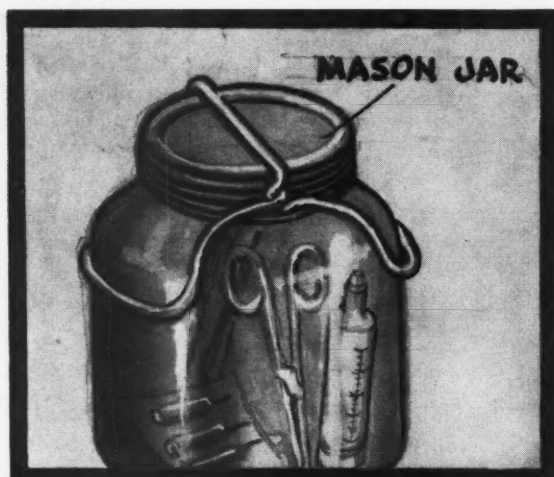
The following 15 practical ways of effectively reducing dental radiation hazards without sacrifice of diagnostic yield were stressed:

1. Elimination of unnecessary and repetitious exposures.
2. Better commercial protection to tube head.
3. Better technician discipline and safe procedure.
4. Use of protective lead apron for patients.
5. Strict collimation and restriction of primary x-ray beam.
6. Use of 16-inch target skin distance.
7. Use of extra fast films.
8. Use of 3-millimeter aluminum filtration of primary beam.
9. Use of 5-minute film development time.
10. High kilovoltage techniques.
11. High intensity film illuminators.
12. Adequate room design, and protective barriers.
13. Physical calibration of radiation output of equipment.
14. Personnel monitoring with dosimeters and film badges.
15. Intensification of roentgen images with screen cassettes.

Adoption of these precautionary methods is simple, practical, and inexpensive.

Indiana University Medical Center
1100 West Michigan Street

1



Clinical and Laboratory Suggestions

Maintenance of Sterility

Stanley Kogan, D.D.S., Killeen, Texas

1. For such seldom used instruments as the syringes and needles used for parenteral injections and emergency drugs, autoclaving in a Mason jar will maintain sterility as long as the top of the jar is not removed.

2



Stabilizing the Face-bow

W. J. Connolly, Jr., D.D.S., Washington, D.C.

2. Place rubber suction cups over the condylar points. The movable ends of the face-bow will rest in the suction cups to prevent the rods from slipping out of position.

3



Dry Field for Cementation

Burton S. Morrow, D.D.S., Chicago

3. Before cementing an inlay, place a pledget of cotton soaked in adrenalin into the cavity. The adrenalin will prevent the seepage of fluid or blood into the gingival area of the cavity preparation.

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For every practical clinical or laboratory suggestion that is usable, DENTAL DIGEST will pay \$10 on publication.

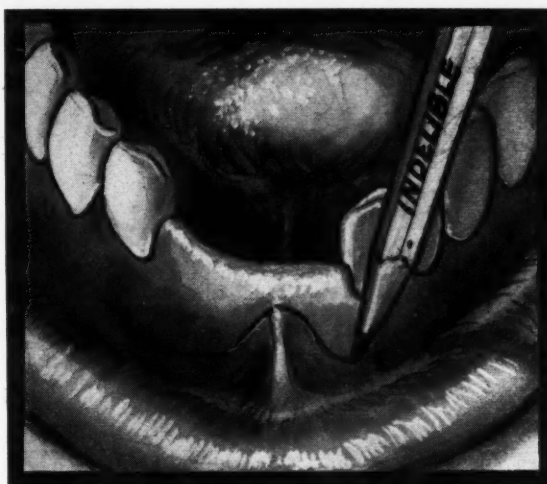
You do not have to write an article. Furnish us with rough drawings or sketches, from which we will make suitable illustrations; write a brief description of the

SUGGESTIONS . . .

Facilitating Impression Tray Construction

J. Ernest Roberts, D.M.D., Burlington, North Carolina

4. Before taking a preliminary impression mark the muscle attachments and denture outline with an indelible pencil. The pencil marks will be transferred to the impression and then transposed to the working model. These markings will mark the peripheral border and will be helpful in the construction of the tray for the permanent impression.

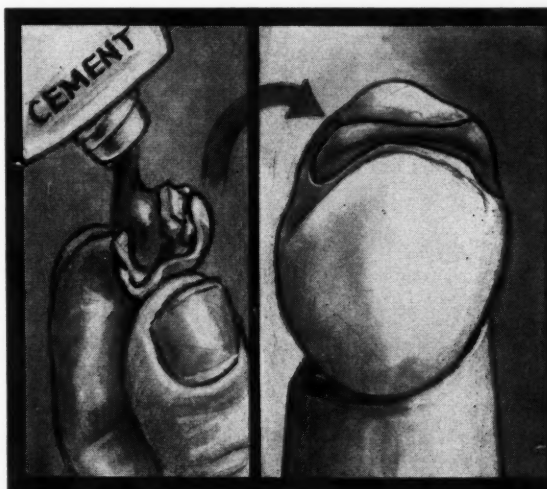


4

Polishing an Inlay on a Metal Die

David J. Davis, D.D.S., Chamlee, Georgia

5. The gold casting is held in place on the metal die with a banana oil type of cement (Duco®) to facilitate polishing.



5

Removing Zinc Oxide-Eugenol Paste

Frank P. Iuorno, New York

6. Cover the zinc oxide-eugenol paste on the spatula with scrap wax. Heat in a flame. When the wax is melted wipe the spatula with a paper towel to remove the paste.



6

technique involved; and jot down the advantages of the technique. This shouldn't take ten minutes of your time. Turn to page 190 for a convenient form to use.

Send your ideas to Clinical and Laboratory Suggestions Editor, DENTAL DIGEST, 708 Church Street, Evanston, Illinois.

The EDITOR'S Page

MOST DENTAL operations are performed with the patient sitting upright in the dental chair. A few oral surgeons insist that the patient be placed in a supine position because they believe that the horizontal position is less likely to favor circulatory collapse: fainting. The supine position, however, has the disadvantage that foreign bodies, blood, and saliva may be more easily swallowed or aspirated.

The patient who is sitting upright and shows the signs of circulatory collapse from psychic or pharmacologic causes may be revived promptly by placing the dental chair in a horizontal position. Fainting is usually caused by sudden cerebral anemia and when the head of the patient is placed at a lower level than the heart the circulation to the brain is restored. Cerebral anemia produces anoxia of the tissues of the brain. The brain cannot long tolerate this deprivation of oxygen. It is believed by most neurophysiologists that the brain is irreversibly damaged after four or five minutes of total anoxia.

A survey by a British anesthesiologist among 386 dentists in the United Kingdom convinced him that the dental patient who is sitting upright during the administration of nitrous oxide may faint without the operator being aware of the condition.¹ If the patient is maintained in the upright position while he is in this state of circulatory collapse he may suffer permanent brain damage.

"The conclusions reached suggest that when a patient in the upright position faints severely enough for his cerebral blood-flow to become arrested, the attack will be followed by disturbance of cerebral function unless he is laid flat within two minutes of its onset. It would not be surprising, however, if a less severe faint, in which the cerebral circulation was only slowed, produced this effect almost as quickly in a patient under dental gas breathing mixtures poor in oxygen. It remains to

be considered how a patient who has fainted under gas comes to be kept upright for two minutes or longer.

"The explanation lies in failure to diagnose the condition. For not only may the onset of fainting be mistaken for the onset of anesthesia, but also the minor convulsive movements may be mistaken for jactitations, for which oxygen is added in small amounts, and pallor and sweating for imminent vomiting, which is best handled with the patient sitting up. Moreover, present-day teaching, taking into account the vulnerability of the brain to anoxia and the fact that oxygen is restricted in this form of anesthesia, insists on the giving of oxygen as the first step in the treatment of an unfavorable reaction: the patient continues to be kept upright while this remedy is applied. In this way the upright position may well be maintained for a good deal longer than two minutes.

"On this basis also may be explained the uneven distribution of cases of delayed recovery in the practices of different dentists, all of whom probably meet with fainting under gas with equal frequency. More senior dentists, trained when the method of continuous administration of gas was not widely practised, accustomed themselves to operating with speed; and they were instructed by anesthetists familiar with the danger of chloroform syncope, for which the treatment was immediate recumbency or even inversion of the patient. Less attention was paid then to anoxia; pallor was the state to be feared and to be treated instantly by laying the patient flat. In the hands of these dentists, therefore, fainting may be correctly and expeditiously treated even though the true nature of the condition is not understood."

Nitrous oxide-oxygen is an excellent anesthetic combination provided that the anesthesiologist never neglects the importance of the oxygen component of the mixture.

¹Bourne, J. G.: Fainting and Cerebral Damage, *The Lancet* 2:503 (Sept. 14) 1957.

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Rheumatoid Arthritis

Rheumatoid arthritis is a disease of mesenchymal structures, chiefly the joints. Its etiology is unknown. Treatment must be directed at control of the general disease process and prevention of deformity and destruction. The aim is to lead the patient into remission or cure by assisting natural reparative body processes.

About 50 per cent of patients are not relieved by the usual measures of rest, diet, analgesics, and splinting. In these cases, suppressive treatment with the steroid hormones may be justified. Such therapy, however, is seldom curative and the inherent difficulties must be fully appreciated before such a regimen is initiated. Treatment on a permanent basis must be considered because relapse generally occurs when ACTH or cortisone is withdrawn.

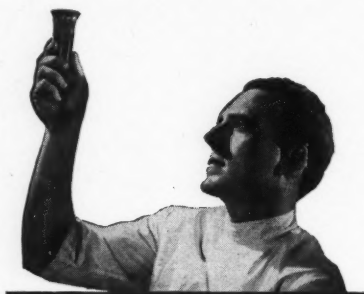
The initial dosage of cortisone is 50 or 75 milligrams a day. Most patients are able to return to former employment. The most serious side effect is psychosis and patients with previous psychologic disturbances should be excluded from such therapy. With severe elevations of blood pressure, an attempt to adjust the dosage should be made. If this fails, cortisone is withdrawn.

A disconcerting effect in women patients is accumulation of fat. Rounding of the face or localized deposits of fat over the lower cervical vertebrae may be noted. Weight increase due to fluid retention is evidenced by peripheral edema. Some patients may have voracious appetites. These effects are sometimes difficult to control, but the dosage of cortisone should be reduced, fluid restricted, and a rigid diet instituted.

The short-term administration of ACTH may be of particular value for patients with limited shoulder movement associated with rheumatoid arthritis. The hormone is usually given for about three weeks, during which time intensive physiotherapy is applied. The drug is discontinued slowly during the last ten days to prevent withdrawal symptoms.

MEDICINE

and the Biologic Sciences



Administration of ACTH for prolonged periods may restore patients crippled by severe arthritis to virtually normal lives. The greatest disadvantage of this program is the self-administration of subcutaneous injections, often every day. The drug may induce remission, however, allowing the discontinuance of therapy.

Copeman, W. S.: *The Management of Rheumatoid Arthritis with Particular Reference to Steroid Therapy*, New Zealand M. J. 55:3-10 (July) 1956.



Lower Extremity Amputations

The chief candidates for amputation involving the legs are patients with arterial insufficiency. Other less common factors are trauma, tumor, and deformity.

Acute insufficiency results from either embolism or localized thrombosis. Prompt embolectomy restores circulation. Amputation becomes necessary, however, when delay is prolonged. When occlusion is due to localized thrombosis, arterial disease is usually generalized. Thrombecto-

my with or without vascular graft may suffice.

When sudden high occlusion cannot be relieved, removal of the leg is inevitable. The operation should be postponed until the level of viability becomes distinct. The patient should be observed for at least two or three weeks.

Chronic insufficiency is usually due to arteriosclerosis. Onset is gradual and signs of circulatory deficiency, such as sensory changes, intermittent claudication, and atrophy of the nails, skin, and subcutaneous tissues becomes evident. As impairment progresses, slight trauma, for example contusion, fungous infection, or careless trimming of toenails, may precipitate severe infection and gangrene.

Patients with insufficiency should be hospitalized for observation and any complicating systemic disease corrected. Except when circulation is totally inadequate, improvement is usually apparent after complete bed rest for twenty-four to seventy-two hours.

During this period of rest, bacteriologic cultures are made and appropriate antibiotics are administered. Only simple dressings, such as saline, are applied. If local sepsis is a problem, as in patients with diabetes, guillotine amputation of the digits, sometimes including the metatarsal heads may be necessary to promote free drainage.

The degree of circulatory impairment may be assessed by examination of the extremity and by critical observation of the patient's reaction to conservative care. Pain of vascular insufficiency is usually poorly localized, deep seated, steady, and burning or gnawing. Prognosis is poor with severe pain in the involved extremity requiring frequent medication. If pain persists even after seven to ten days of bed rest, high amputation is necessary, whereas local amputation suffices when discomfort subsides rapidly.

Appearance of the infected portion of the limb helps reveal the status of circulation. Edema, cellulitis and suppuration denote better vascularity than do dull and blotchy cellulitis,

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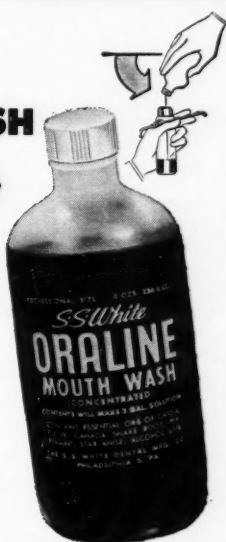
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slight or no edema, tissue necrosis and secretion of watery pus.

The rapidity with which demarcation occurs between gangrenous and viable tissues is important, since this separation will be seen only where blood supply is adequate. Generally, three weeks of observation is sufficient. If the disease process is not controlled by this time, conservative amputation will probably be unsuccessful.

McKittick, John B.: *Amputation of the Lower Extremities*, Gen. Practitioner 13:104-113 (June) 1956.



Aortic Aneurysm—Repair

Abdominal aortic aneurysm is as malignant as many forms of cancer. Although an aneurysm may not progress or rupture, no available method can predict which case will follow a benign course.

Most arteriosclerotic aneurysms involve the lower abdominal aorta.

Syphilitic aneurysms usually inhabit the thoracic aorta and are rarely seen in the abdominal aorta. Arteriosclerotic aneurysms may result from the stress at the aortic bifurcation that thrusts laterally to initiate dilatation. In addition, elongation of the aorta between the diaphragm and the iliac fascia due to the atherosclerosis may be a factor.

Abdominal pain is the most common symptom and the usual physical sign is an abdominal mass, often palpable in the midline or on the left side. Anteroposterior and lateral films of the abdomen may show the dilated aorta outlined by calcific deposits, whereas the aortogram reveals only a smooth tube about the size of the aorta without evidence of disease.

In general, most patients with an abdominal aneurysm are surgical candidates for resection and grafting. Emergency operation is indicated when rupture or leakage has occurred. A suitable graft or prosthesis and an experienced surgical team are essential. Currently, homologous aor-

tic grafts are being used widely, but plastic grafts of nylon, orlon, and vinyon are becoming popular.

Surgery probably should not be done for patients with recent or repeated myocardial infarctions, severe coronary insufficiency, arterial insufficiency of the lower extremities and impending gangrene, or insufficiency of the renal arteries. If possible hypertension should be corrected before surgery. The only absolute contraindication is an inevitably fatal disease.

Postoperative care is important and may make the difference between success and failure of surgery. The feet of the patient should be kept six inches below heart level in order to lower resistance to arterial flow. Heparin should be injected into the distal iliac arteries when the aorta has been occluded during extirpation of the aneurysm.

Peripheral vasoconstricting drugs should not be administered and dehydration should be avoided. Antibiotics are used prophylactically. Both gas-

(Continued on page 184)



**prevent
gagging**

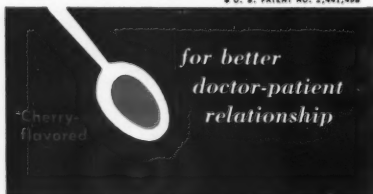
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tric dilatation and bowel obstruction must be prevented. Active exercise of the lower extremities is begun as soon as the patient regains consciousness.

Wright, Irving S.; Urdaneta Enrique; and Wright, Barbara: Re-opening the Case of Abdominal Aortic Aneurysm, Circulation 13:754-768 (April) 1956.



Competitive Sports For Children

Sports leagues for children, formally organized on a community and national basis, are common. There is no unqualified yes or no answer to the question whether such leagues are good for children. Normal growth and development of children lead to competition. Attention must be paid, however, to the principles of physical education and to the contribution of athletics to the emotional and behavioral maturity of the child.

As a rule, children 8 to 12 years of age are ready for and like competition. During this time the child has an organic need for strenuous physical activity and the idea of belonging to a team is appealing. At 11 and 12 years of age, a child is usually willing to submerge personal ego for the good of the team and to practice for long periods of time to acquire or improve skills.

Although 8 to 12-year old children are normally healthy and sturdy, the amount of stimulation or pressure that can be tolerated without tension varies. The children in this age group differ widely in size, strength, and endurance. Usually the need for relaxation is not recognized and the child is likely to go beyond the normal fatigue point in strenuous play.

A medical examination should be mandatory before a child is allowed to participate in organized competitive sports. Disabilities that might reduce physical skills or might be aggravated by strenuous activity would be discovered, and the stage of physical growth and development would

(Continued on page 186)

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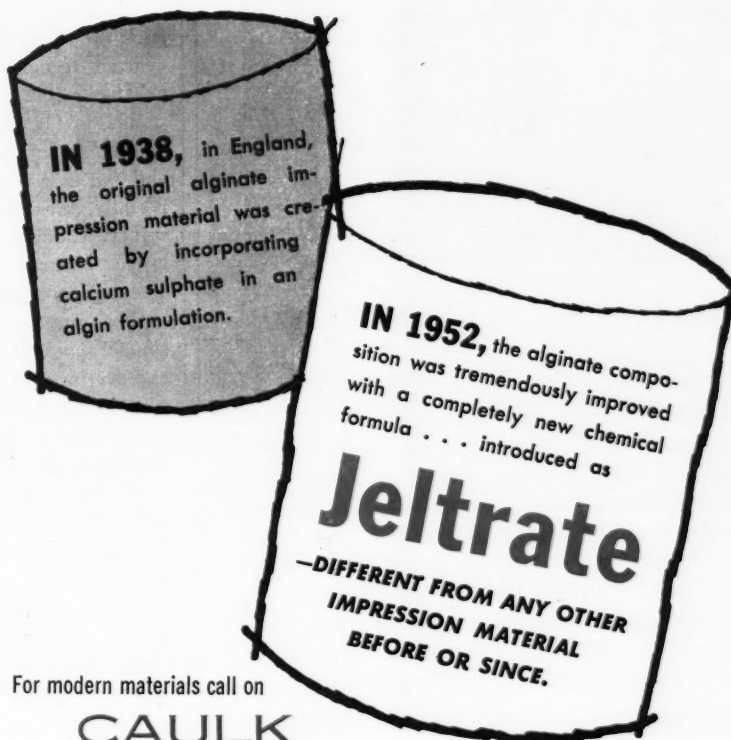
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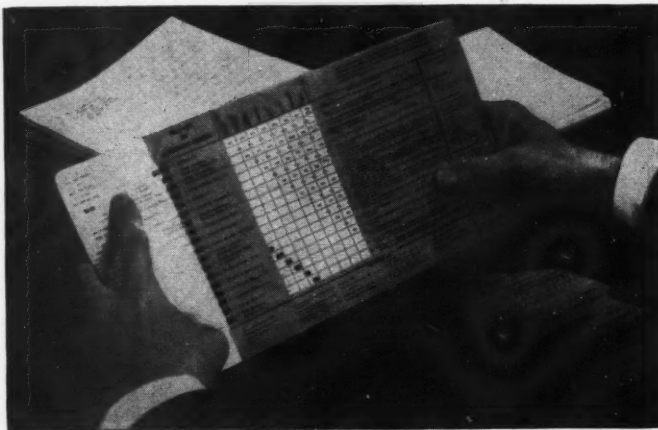
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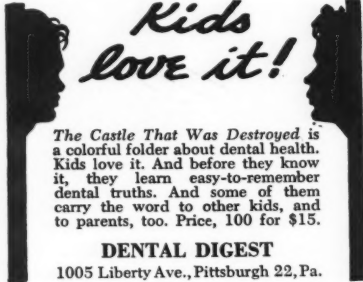
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be estimated. Examination should include (1) measurements of height and weight, (2) tests of vision and hearing, (3) evaluation of the heart and blood pressure, and (4) a search for hernias and orthopedic disorders.

Even with physically fit children physical harm from competitive sports is a problem. The likelihood of a carry-over of activity beyond harmful exhaustion must be considered when standards for competition are established. Most orthopedists believe that children 8 to 14 years of age are especially vulnerable to bone and joint injury. Children should not be allowed to participate in such violent contact sports as tackle football, ice hockey, and boxing. Participation in contact sports, however, is not the sole aggravating factor. The likelihood of such injury appears to be almost as great with spontaneous play and unorganized athletics.

Children should not be regarded as merely "little adults" and their welfare should be in the hands of people who are properly trained for the job. Emphasis should be on fun and the way of playing, not on always winning or on publicizing the league. The system of concentrated attention on a selected few is not good either for those who make the all-star team or for those who are disqualified. Many undesirable features of the little leagues could be eliminated by discontinuing sponsorships of teams by business organizations and by having tournaments only on a community-wide championship schedule.

Shaffer, Thomas E.: Are Little Leagues Good for Children?, Pennsylvania M. J. 59:447-450 (June) 1956.

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Who is the Ideal Patient?

Every dentist probably has an image of an ideal patient. In turn, every patient has a notion of what he would consider to be an ideal dentist. We can be certain that these images of perfection that are held by both the dentist and the patient are entirely unique and would not fit in detail into the pattern held by any other person.

Scope Weekly, a medical publication, put the question "What would you consider to be an ideal patient—and have you ever had such a patient?" Four physicians were asked the question. Their replies, each original and highly individual, give evidence of how varied are the values.

An internist: "It is my opinion that the ideal patient must have a physician who will build a foundation of mutual confidence and cooperation between the patient and the physician . . . Needless to say, the ideal patient who follows such a cooperative procedure is also sure not to overlook the doctor's bill. Yes, I have such patients."

An otorhinolaryngologist: "My ideal patient would be one who calls his doctor at reasonable hours, barring real emergency. He would keep his appointments. He would not be preopinionated on his diagnosis when he walks into the doctor's office for the first time. He would be able to describe his symptoms clearly. He would follow his doctor's instructions and have enough will power to break bad habits, such as smoking and overeating . . . And finally, the ideal patient would, of course, be one who pays his bills promptly. I would say that about half of my patients are acceptable in every respect."

An obstetrician-gynecologist: "There are many types of ideal pa-

tients but in general I would say that they have several things in common. One, they follow instructions but ask intelligent questions; two, they have confidence in you; they are appreciative; four, they do not self-diagnose or self-medicate."

A psychiatrist: "There is no ideal patient, any more than there is an ideal disease. Or perhaps the ideal patient is the one who has the ideal disease, in which case the physician would never see either. All of this makes an amusing philosophical question-and-answer game but it has little connection with reality. Since we

never treat diseases, but rather people suffering with diseases of different and varied natures, and therein lies the pitfall of some of the lack of human contact between the 'scientific' physician and the 'human' one."

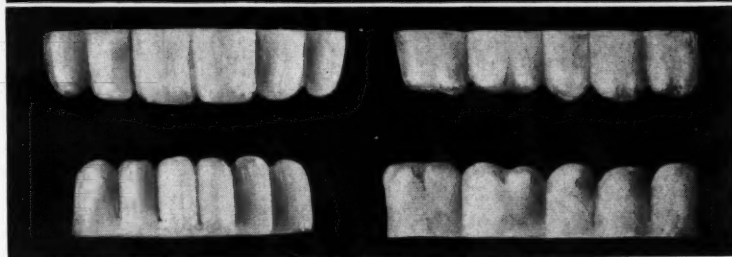
The first three answers were "practical:" the ideal patient is docile, he follows instructions, he does not diagnose his own disease or prescribe for it, he pays his bills. This view is probably the one that is held by most physicians who prefer to function in the authoritarian role: no questions asked, I will do all the thinking and

(Continued on page 189)

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the talking! Leave everything to me.

The psychiatrist, however, sees the patient and his disease in a broader framework. People are variable in structure and function; no two people ever react the same to their disease. One is rapidly overwhelmed by his disease; another has magnificent resistance to attack. This difference is what Roger Williams calls the genetrophic principle:

"Every individual organism that has a distinctive genetic background has distinctive nutritional needs which must be met for optimal well-being. When stated in this way very few indeed would question its validity. At the human level those who think that individual variations in body chemistry are minimal may well think that the principle, though true, is of little importance. If variations in body chemistry are large, however, the importance seems clear. The importance or nonimportance depends clearly upon how great the individual variability is.

"If during embryonic development, a particular ovum has needs which cannot be satisfied in the environment provided, then it either dies or its organs and functions fail to develop in a well-rounded fashion. If, during childhood, the individual has nutritional needs which are not fully satisfied, his metabolism is altered accordingly; he becomes a prey to infections, and his growth becomes retarded or distorted. If, during adulthood, the individual—through ignorance or for other reasons—fails to meet his particular nutritional needs, he becomes deficient, and this deficiency may contribute to all manner of disease and disease susceptibility. As the individual ages, some of his organs and tissues fail earlier than others because, in accordance with their genetic pattern, they have special characteristics or weaknesses. These weaknesses may involve unusually high nutritional needs for specific substances which are not provided adequately by the environment in which the organ or tissue resides."

In the specific case of dental caries Williams mentions what every dentist knows: that children vary widely in their susceptibility. One child has

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rampant caries, another is totally immune. Early loss of teeth is a pattern observed in some families; in other cases children in the same family have different degrees of susceptibility.

Williams continues: "In both fields, medical and dental research, we believe the genetrophic approach abolishes the unfortunate stigma which has become attached to 'hereditary diseases'—diseases about which, according to the conceptions of many, nothing can be done. The case of dental caries is a good case in point. Is

it a hereditary disease? There is strong evidence that susceptibility to it is hereditary. Is dental caries a nutritional disease? Yes, and in spite of its genetic roots something can be done about it—and is done whenever children are fed superior rather than inferior diets."

In his concept of biochemical individuality, or the genetrophic principle of disease, Williams leans strongly to the view that the single most important environmental variant in

(Continued on page 190)

CLINICAL AND LABORATORY SUGGESTIONS

(See pages 178 and 179)

Form to be Used by Contributors

To: Clinical and Laboratory Suggestions Editor

DENTAL DIGEST
708 Church Street
Evanston, Illinois

From: _____

Subject: _____

Explanation of Procedure:

Sketch:

Suggestions submitted cannot be acknowledged or returned.
\$10 will be paid on publication for each suggestion that is used.

any disease is nutritional. "Because teeth are organic structures produced as the result of metabolic processes, there is not a single vitamin, amino acid, or other nutritional factor which may not be implicated in the disease. Probably many different deficiencies are involved in the production of the sum total of all caries existing in all individuals."

Another eminent biochemist, Albert Schatz of the National Agricultural College, has also emphasized the *organic* role in dental enamel and dental caries:

"The present investigations were carried out from the point of view of the proteolysis-chelation theory, according to which dental caries occurs as a result of the more or less simultaneous degradation of organic components and the dissolution of minerals via chelation. This mechanism is therefore not restricted to lactobacilli, acid, and pH considerations. According to proteolysis-chelation, dental caries is an infectious disease, like many others, in which an essentially organic though heavily mineralized body structure; namely, enamel, is attacked. Most if not all organic constituents of enamel may undergo breakdown by oral bacteria, and may give rise to substances that can dissolve calcium phosphates via chelation reactions. In recent studies, Bacterium No. 17 was shown to be capable of catabolizing hair, normally calcified dental tissues, carbohydrates, fermentation acids, lipids, and other substrates. The metabolic activities of a mixed culture or oral proteolytic flora were also tested."

All this basic biochemistry is tied up with the idea of the ideal patient and the ideal dentist. Each is an ever-changing human being who reacts one against the other. There are infinite combinations that include millions of kinds of genetic and environmental factors. Disease, any disease, is a process that includes countless facets. Our ancestors, the peculiar kind of bacteria or viruses that are attracted to us, our food, our life habits, our occupations, the metrologic conditions under which we live, our human associations, our attitudes and values

—these are some of the variables that make each person different from every other person, that make every disease process unique.

The ideal patient is one who is in rapport with another person (the dentist or physician) at a particular moment in time in the life cycle of each. A shift in the biochemistry of either may change the relationship completely.

We are all aware, to some extent, of our own mood-swings and feeling-tones. We are also lenient and generous in the judgments of ourselves when we are euphoric or depressed. We are all subject to tides in our biologic affairs and ups and downs in the biochemical events. Often, however, we fail to credit the other fellow with the same kinds of variables. When we look at the other person we are inclined to judge him as a static object that we like or dislike, as an ideal or as an undesirable patient. Such judgments violate the laws of biology and the virtue of charity.

—E. J. R.



Visual Aids

Dear Editor: Many years ago I was given a booklet printed by your company, called *Visual Education in Dentistry*. It has saved me many hundreds of hours of "Don't believe a word you say" explanations. My copy has now become threadbare and I would like to be able to purchase another, together with any booklets you have available that would be of value in dental surgery.

In this part of the world we seem to be able to keep abreast of English dentistry but are widely divorced

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Slightly Controversial

Just left Dr. J. S. at the Philadelphia airport. He is flying back to his home in California, after a brief visit here. Dr. S. is one of the most brilliant minds in or out of dentistry. It is his patent we acquired for the manufacture of FluorOn, #2,665,218.

Let us read a few excerpts from the patent itself. "This invention comprises . . . a filling material that has in it a salt of fluorine which I have found . . . renders the surface of the tooth it contacts immune to dental decay." Another, "a base made of fluorine containing cement . . . render(s) the remaining portion of dentine practically caries proof with the possibility of extending its caries inhibiting effect on the entire tooth." This was in 1948.

Now let us continue. A.D.A. JOURNAL, May 1957. (Phillips and Swartz) "The commercial product FluorOn resulted in a considerable reduction in solubility . . . of dental surfaces" also "the reduction in solubility of samples after treatment with FluorOn was exceedingly high."

PROGRESS BEGINS IN THE MIND.

Our thought is this. There is no question about the fact that minute amounts of fluoride passing over a soluble enamel surface for a week or two will change the

enamel to insoluble enamel, caries immune.

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from the American approach. Could you make any suggestions on how to overcome this lack of contact? Are there any books on design and ideas of modern dental surgeries?

Philip Rosen, L.D.S., R.C.S. (Eng.)
31-35 Mimosa House, Ninth Avenue
Bulawayo, South Rhodesia

New Techniques and New Products

Dear Editor: While on a visit to Paris a few years ago I was invited by a friend to attend an extremely interesting dental meeting. The American

dentists in and around London were in Paris for a joint meeting with the American dentists in and around Paris. Later, I learned that these meetings alternate between London and Paris. For the Londoners, this was a real treat and a holiday as it gave the men a chance to get away from rationing which was still in effect in London. As a point of interest, dinner started at 8 p.m., and lasted until 9:30. The scientific meeting then followed, and the entire evening did not go much beyond 11 p.m.

(Continued on page 192)

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part of the meeting. A brief report was given of a new dental product. I was informed by my colleague that there was a standing committee on "new techniques and products" and that this was one of the highlights of the evening. Those in attendance eagerly learned of some new useful gadget and I felt that interest was being aroused and enthusiasm created.

Upon taking office as President of my branch dental society, I instituted such a committee. Its chairman has

tried to establish contacts in the profession and with the allied fields, such as pharmaceutical houses. We have had reports at every meeting, and I believe this activity is attracting interest and is well worth while. For example, we had descriptive literature and photographs of the Borden Aerator long before it was available. Recently we presented a report, *Aortic Artery Grafts to Remodel the Alveolar Ridge* (DENTAL DIGEST, November, 1957). These announcements take

only a few minutes and add greatly to the success of the monthly meetings. They also are an indirect method of inducing men to leave the four

I was particularly interested in one walls of their offices and mix with their colleagues.

The success of this committee naturally rests with the efforts and enthusiasm of its chairman. It will be some time before we are "snowed under" with newer knowledge and reports and then it may be necessary to separate the wheat from the chaff. At present this is not the case. Those of us who have been around a while believe that there is always some new development in our field. So let's find out and keep up to date!

Herbert B. Goodman, D.D.S.
President (1957)

Queens County Dental Society
535 Plandane Road
Manhasset, New York

Canker Sores

Dear Editor: In your January issue, on page 19, in the discussion of canker sores, suggestions for treatment are requested.

I have been in the practice of dentistry more than twenty-four years and have treated hundreds of cases of canker sores successfully.

In my experience most canker sores are *allergic* in origin. These patients are *sensitive to acids* in the diet, particularly *ascorbic acid* and *acetic acid*. The sores disappear and will not return if these patients will eliminate the following from their diets: vinegar, mayonnaise, sour pickles, ketchup, mustard, sauerkraut, lemons, oranges, *tomatoes*, pineapple, grapefruit, limes, sour grapes and *all berries*.

Eliminating the foods enumerated, as I suggest, may sound too simple a remedy, but it definitely is efficacious. Other persons may exhibit sensitivity to highly acid food from gaseous fermentation in the gastrointestinal tract but the cause is still the same.

Morris Moskowitz, D.D.S.
1006-49th Street
Brooklyn, New York

The Word is "Operative"

Dear Editor: In the publication of

(Continued from page 192)

my article *Anesthesia for Extractions Without Lip Sensations*, (DENTAL DIGEST, January, 1958) I did not make the statement: "attempts to utilize the technique for some other surgical procedures," but rather stated, "attempts to utilize the technique for operative procedures." Operative is the term applied to preparation of the tooth for the placing of a restoration such as amalgam, gold inlay, or silicate. No attempt whatsoever has been made by me to employ this technique for any surgical technique other than extractions.

A. Lawrence Bram, D.D.S.
7 Old Post Road, South
Croton-on-Hudson, New York

Anesthetic Procedure Without Lip Sensations

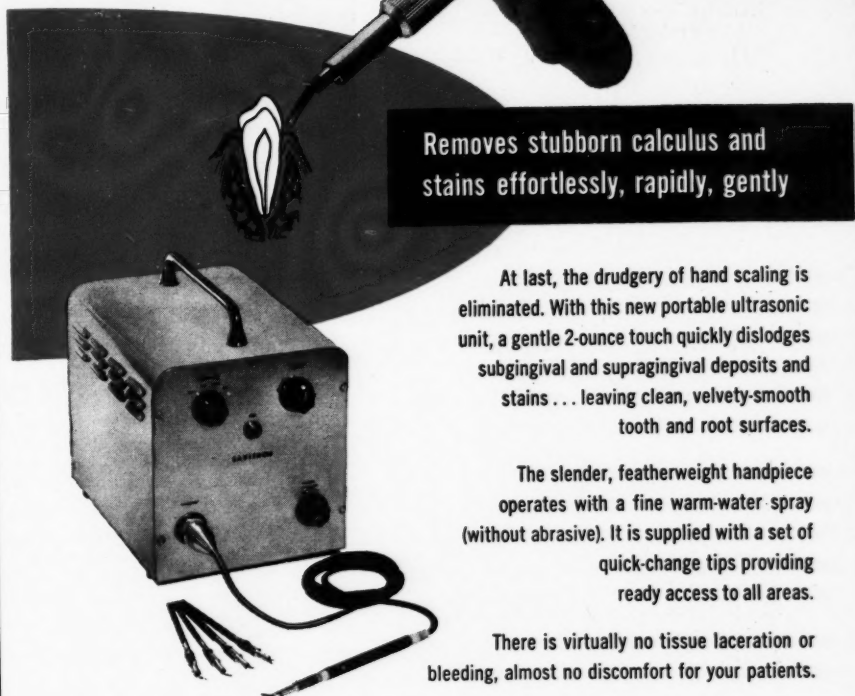
Dear Editor: I was edified and interested in the article by Doctor Bram in the January issue in regard to anesthesia for extractions without lip sensations. In my opinion the lip sensation is less objectionable to the patient than puncture of the papilla with the needle. For years, feeling that we all shrink from needle puncture of the papilla, I have slid the needle alongside the tooth just under the free margin of the gum and flooded the area gently with the anesthetic solution, with no pressure and no appreciable tissue penetration. Of course, before inserting the needle under the free margin the usual precautions are taken; the area is flushed with peroxide or a suitable cleaning agent, it is wiped dry with a wisp of cotton twisted on a Kerr file or similar instrument.

In a short time the surrounding tissue is influenced by the solution and then the papillae on either side of the tooth can be injected with no pain and discomfort to the patient whose remark is generally, "I never felt the needle," which is, I am convinced, the pet fear of most people.

I submit this idea for what it is worth and would welcome your reaction.

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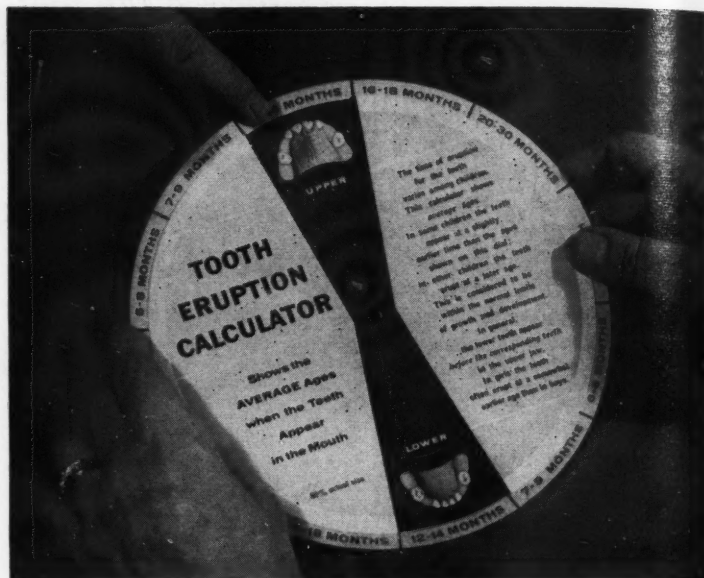
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